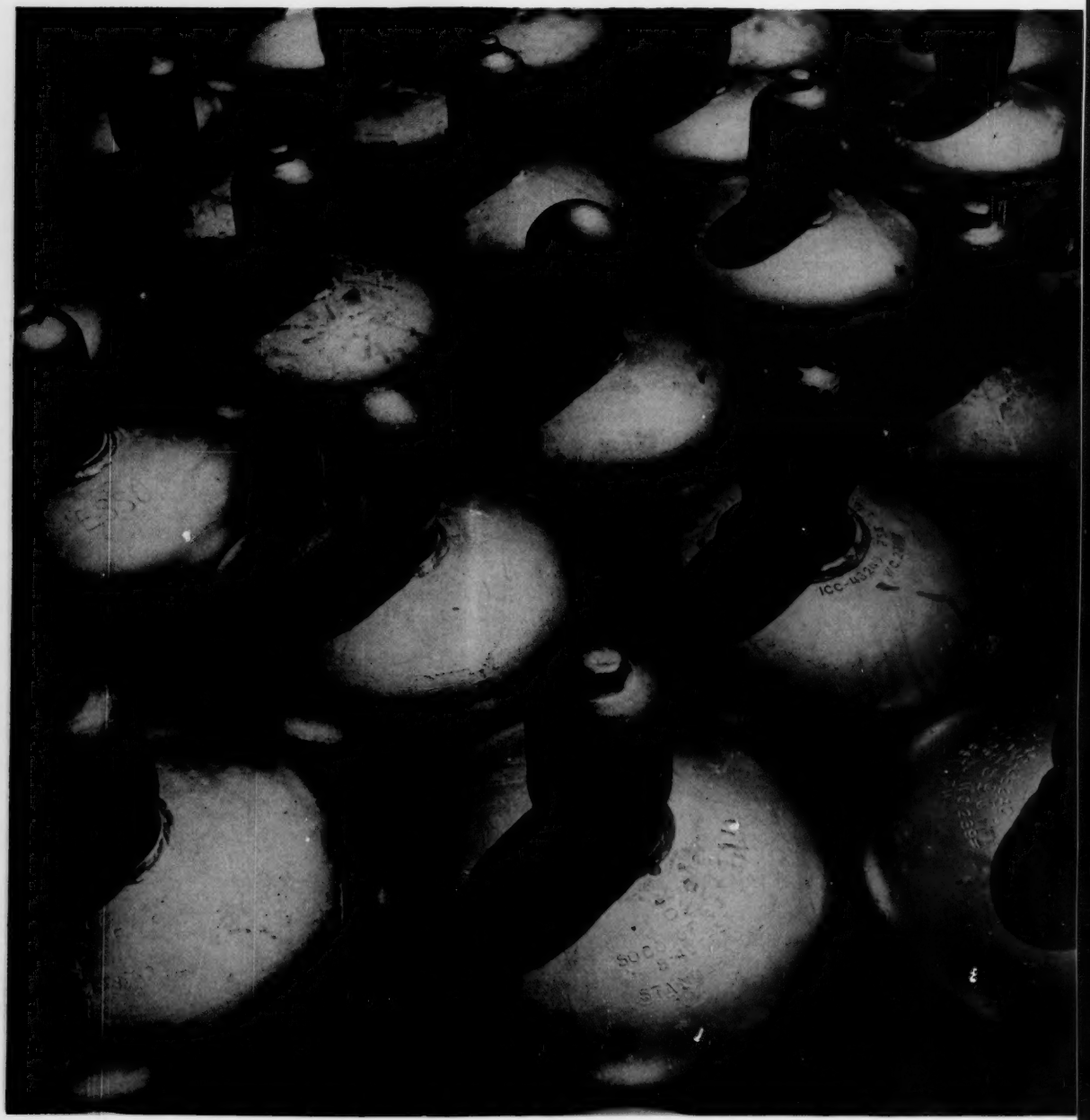
the magazine of STANDARDS



SEPTEMBER, 1961

the magazine of STANDARDS

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Vol. 32 No. 9 SEPTEMBER, 1961

FEATURES

NEWS

DEPARTMENTS

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ASA

THE COVER: Do these compressed gas cylinders hold oxygen, carbon dioxide, or some other gas? There is one way to be sure the wrong gas cannot be used or mixed with another in a potentially dangerous combination. For safety, insist that the connection on the cylinder is the standard connection assigned to the particular type of gas for which the cylinder is being used. For a graphic description of why this is important, see page 273.

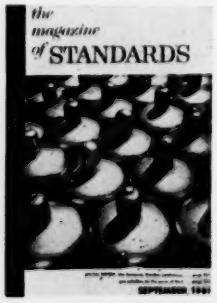


Photo: Standard Oil Co. (N. J.)

notes

Thanks are due our alert readers!

Since publication of the article, "The Challenge of the Decimal Inch," several have called attention to the fact that the drawing of the Franklin stove (page 100, April 1961) does *not* show that Benjamin Franklin used decimals instead of common fractions for submultiples of the inch as indicated in the caption. The drawing shows the scale divided into units of 10 inches rather than units of 12 inches, however.

When letters on this point were received, the editor referred them to P. G. Belitsos, author of the article. (Mr Belitsos, it should be pointed out, had no hand in selecting the illustrations for his article.) Intrigued by the questions, Mr Belitsos had a search made for information about the decimal system and its possible use by early Americans. What he turned up makes interesting reading.

There is no historical documentation that associates Benjamin Franklin with the use of the decimal system for dividing the inch, he reports, although history shows that many Americans in the Eighteenth Century argued in favor of a decimal system for money and also for weights and measures.

It was Thomas Jefferson, however, who was particularly interested in the decimal system, and whose report in 1784 led to the government's decision to set up the U.S. monetary system on a decimal basis. Jefferson also proposed that a decimal system be adopted for the new nation's weights and measures, but without success.

• Plans for the National Conference on Standards at Houston, Texas, in October, now practically complete, promise three days of unusual interest. The keynote of the meeting will be sounded by Donald J. Hardenbrook, national vice-president of the National Association of Manufacturers and board chairman of the American Creosoting Corporation. (See back cover for more details.)

This Month's Standards Personality

Leslie Price

FEW ASSOCIATION EXECUTIVES have a reputation for dedicated service in standards to compare with that of Leslie Price. Manager of the National Electrical Manufacturers Association's Engineering and Safety Regulations Department, Mr Price has responsibility for NEMA's staff activities concerned with engineering and safety, including standards. As secretary of NEMA's Codes and Standards Committee, he works with representatives of NEMA's members in development of NEMA engineering standards and in cooperation with other organizations on American Standards and international recommendations. Not content with second-hand knowledge of the ways of nationally representative committees, Mr Price has gained personal experience as an alternate member of many ASA sectional committees and of the Graphic Standards Board. He keeps in close touch with the work of all committees on which NEMA is represented, and as a result of his intimate knowledge of the work under way, contributes authoritatively and effectively in helping NEMA representatives carry out their assignments.

Mr Price is also secretary of the NEMA Committee on Safety Regulations, which works to bring about uniform acceptance throughout the country of the National Electrical Code and the standards and product listings of Underwriters' Laboratories as the safety criteria for electric products.

Chosen by the U.S. National Committee of the International Electrotechnical Commission as U.S. observer to the International Commission on Rules for Approval of Electric Equipment (CEE), Mr Price has a world-wide acquaintance among managers of research and testing laboratories. Referring to CEE, the citation on his election as a Fellow of the Standards Engineers Society commented, ". . . his competent and forthright explanations of the American viewpont have had an important bearing on the decisions reached."

Perhaps the best commentary on the characteristics that make Les Price an outstanding standards personality comes from a colleague in another association. "Because of his approachable nature," he says, "it has been easy to discuss common problems of concern to both organizations and to reach solutions when otherwise there would have been separate and overlapping actions."

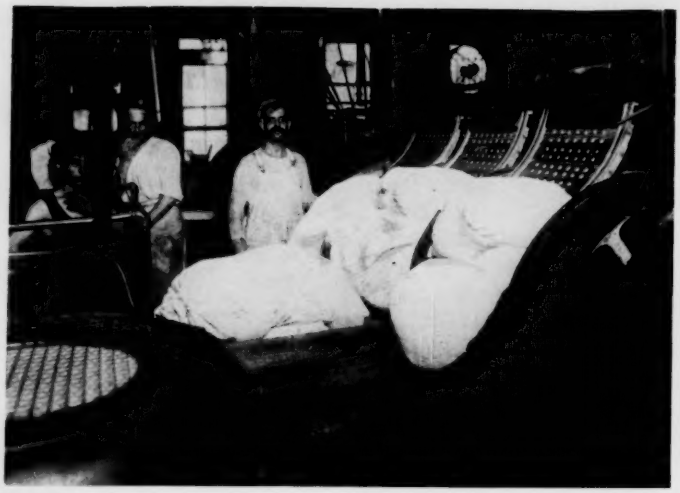
Mr Price is a Registered Professional Engineer in New Jersey, and a Fellow of the American Institute of Electrical Engineers as well as of SES. He is also a member of the American Society for Testing Materials, the International Association of Electrical Inspectors, the Building Officials Conference of America, and the Electrical Section of the National Fire Protection Association.

Mr Price's hobbies include restoring a 1790 house at his 56-acre salt water farm in Harpswell, Maine, wood-working, music, mineralogy, reading, and refinishing early American furniture.

YESTERDAY

AT RIGHT: Central power necessitated series of belts to operate this entire plant. Belts were completely exposed. Hand lever (above wheels at right) engaged or disengaged belts. Wooden tumbler washers could be opened while still tumbling. Extractor (lower left) had grilled cover, no interlock, and could continue to whirl after cover was lifted. Note workmen's loose sleeves, hazardous with moving machinery.

BELOW: She worked in one of the best laundries of its time, but this operator was in danger. Pulling ironer cover, she released lock and closed cover by pressure on the foot treadle. This left her hands free. A moment's carelessness could catch her hand in the ironer. Note that girl operated two machines. One (just beyond her) is shown locked in place on garment being pressed.



Photos: Brown Bros.

Laundry Standard Reflects

by L. P. Bloomer

As is the case in most other industries, commercial laundries have taken on a new character during the past 40 years. Direct-unit power drives have eliminated the main line shafts and jack shafts which were the modern source of power transmission in the early 1920's. Speed cones have made it possible to attain variations in the speed of the equipment, and clutches are being used instead of slipping belts. A commercial laundry is no longer a confusion of belts and pulleys; now it is a collection of self-contained units—marking machines, washers, extractors, dryers, ironers—many of them large machines capable of handling 300 lb of textiles at one time. Today's commercial laundries turn out work on a mass basis, for hotels, restaurants, diaper services, and industries of various types that handle textiles on a large scale. A launderette or small neighborhood laundromat does not qualify as a "commercial laundry."

Not only has the equipment changed, provisions for the safety of laundry operators have improved, too. The American Standard Safety Code for Laundry Machinery and Operations, originally approved as a tentative standard in 1924, and approved without revision as American Standard in 1941, has played an important part in bringing about safer working conditions in commercial laundries since the 1920's. However, the need for continued attention to safety despite improvements has resulted in a new edition of

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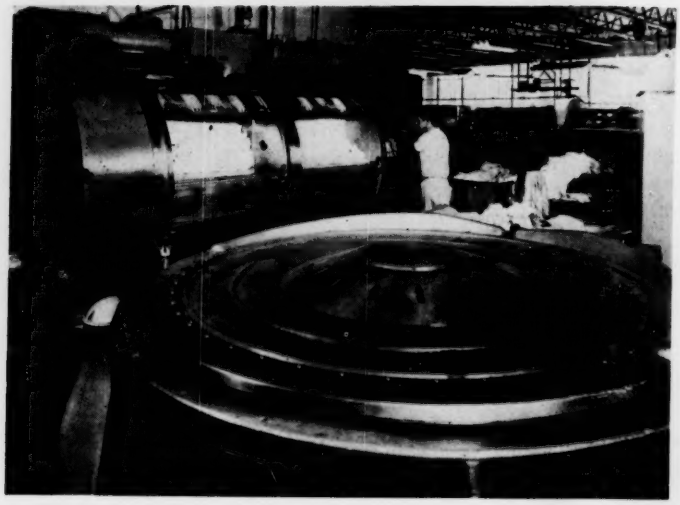
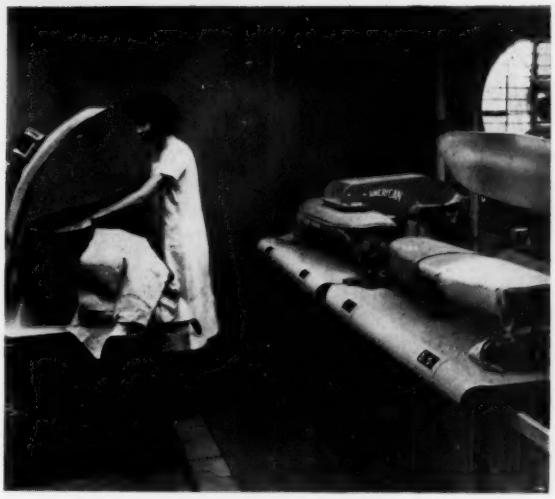
MR BLOOMER, chairman of Sectional Committee Z8, Safety Code for Laundry and Dry-Cleaning Machinery and Operations, is with the American Mutual Liability Insurance Company.



TODAY

AT LEFT: Compare with picture at far left. Here primer mover is attached to machine, eliminating belts and pulleys. Guard (far left in picture) protects belts and gearing. Interlock keeps tumbler doors closed unless mechanism is disengaged. With doors open, tumblers cannot be moved. Extractor (foreground) also is interlocked; basket cannot be moved if cover is lifted. Cover cannot be lifted when basket is in motion. Equipment is all metal—no splinter hazards.

BELOW: Two-hand controls (buttons on machines at right of picture) keep operator's hands away from danger. Both buttons must be pressed and held while cover is lowered to meet lower plate. Girl can operate three or more machines.



Photos: American Laundry Machinery Industries

Changing Industry

the standard, re-edited and updated in line with modern conditions.[1]

In the 1920's, labor was cheap. Emancipation of slaves had become a reality, but emancipation of the man in industry, in terms of his welfare and human dignity, was in its infancy. The laundry was no exception. Hot, steamy atmospheres were unbearable, and wet, soapy floors were hardly safe even with the use of boots. The mechanical hazards in the laundry seemed to have reached a peak. Rotating washing machines, unprotected, maimed unthinking workers; high-speed spinning extractor baskets caught, twisted, and broke arms, even spinning the people themselves about like tops; leather belts, pulleys, and protruding set screws seemed to attract long hair and loose clothing to pull them into the machines. Such conditions, coupled with the health problems related to the hand-sorting and handling of people's soiled laundry, can undoubtedly be blamed for some of the stigma formerly associated with the term "washwoman."

Something had to be done about the needless human sacrifice that these conditions were causing.

Several organizations offered their help. In June 1922, the National Association of Mutual Casualty Companies, American Institute of Laundering, and the Association of Governmental Labor Officials (now the International Association of Governmental Labor Officials) agreed to sponsor a project under the procedures of the recently organized American Engineering Standards Committee (now the American Standards Association). W. G. Conover of the Pilgrim Laundry Company, Philadelphia, was chairman of the sectional committee organized to work on this project.

Because of the urgency of the problem, committee action was rapid. By January 1924, a proposed tentative standard, which concentrated on protection of the power transmission equipment and on points of operation of the hazardous machinery, was submitted to ASA. This proposed standard was approved in June, printed, and distributed in October 1924 as Tentative American Standard Z8-1924.

Its job done, the sectional committee was discharged. Some former members of the committee, however, accepted assignments to a Permanent Committee on Interpretation, or to serve as advisors on requests for exceptions to the safety provisions of the standard.

The commercial laundry industry accepted Z8-1924. Laundry equipment manufacturers revised designs so as to provide a maximum of protection to industrial users; and those states which had not developed their own safety codes for laundries used the Tentative Standard as a guide. The industry's injury rate began to drop.

[1]American Standard Safety Code for Laundry Machinery and Operations, Z8.1-1961, $1.00.

In 1939, as a result of a revision of the American Standards Association's procedure and elimination of the former designation "American Tentative Standard," all sponsors were required to review any tentative standards under their jurisdiction and either revise them for approval as American Standard or advance them in their present form to the status of American Standard. Under this procedure, Z8-1924 was reaffirmed and approved as American Standard Safety Code for Laundry Machinery and Operations, Z8-1941.

DURING THE FOLLOWING YEARS, several questions of interpretation of Z8-1941 were submitted to the American Standards Association. It was also suggested that perhaps this code should be re-examined, in light of the industry's progress, to determine whether it was still adequate under present conditions.

As a result of this suggestion, the 1941 edition of the American Standard Safety Code for Laundry Machinery and Operations has been carefully studied by a reorganized sectional committee which prepared the new, 1961 edition, now approved by ASA, and published. The sponsors of the project are the National Association of Mutual Casualty Companies, the International Association of Governmental Labor Officials, and the Institute of Industrial Launderers.

On the new edition, editorial changes have been made and the material rearranged to make it more useful. Wherever necessary, the recommendations have also been changed to recognize new methods of operation and types of equipment that were not in existence when the original standard was written.

Needless to say, the standard applies to the operations of the large commercial laundries where a tumbler is capable of handling a load of up to 300 lb. It does not apply to a home washing machine which has a capacity of 8 or 9 lb. It is particularly concerned with safety of the moving parts of equipment used in laundries. For example, power marking machines must be equipped with a device that will prevent injury to fingers should they be caught between the marking plunger and the platen or with some device that will actually prevent the operator's hands from coming into contact with the machine. The washing machine itself must be equipped with an interlocking device that will prevent the inside cylinder from moving when the outer door on the case or shell is open, and that will also prevent the door from being opened while the inside cylinder is in motion. Such a device prevents an operator from attempting to handle the clothes being tumbled or whirled in the washer. Many serious accidents have happened when an operator, reaching into the moving cylinder, has become entangled in a piece of material which has wrapped around his arm while the cylinder has been in motion. Extractors must be equipped with an interlocking device that will prevent the cover from being opened while the basket is in motion and prevent the power from operating the basket when the cover is not fully closed and secured. Engines driving an extractor must each be provided with an approved engine stop and a speed-limit governor.

Each power wringer must be equipped with a safety bar across the entire front of the feed or pressure rolls so that the machine will stop if the operator's hand strikes the bar or guard.

Starching, drying, and finishing machines must be guarded in such a way that operators will be prevented from coming into accidental contact with dangerous parts.

Special provisions are included for safe handling of steam pipes and steam-pressure apparatus.

One interesting stipulation calls attention to the special application of this standard. This states that the standard does not apply to dry-cleaning operations.

The dry-cleaning industry has developed rapidly during the 1940's and many of those concerned believed that a safety standard was needed. As a result, a number of groups volunteered to sponsor work to develop a safety code for dry-cleaning establishments. The American Standards Association authorized a project, identified as Z42. However, the project remained inactive. As a result, the sponsors resigned in 1951. Thereupon, ASA authorized withdrawal of the Z42 project. In view of the relative similarity of the machinery and operations in laundries and in dry-cleaning establishments, it was decided to expand the Z8 project to include work on dry-cleaning machinery, operations, and health and fire hazards.

Work on the dry-cleaning standard was started in 1956, but interest in it lagged. Special problems arose in the dry-cleaning field. It was found that more information was needed and that a subcommittee would have to start from the very beginning to develop recommendations for a standard for protection of health and for fire safety. None of the sectional committee members was interested in accepting the responsibility as chairman of such a subcommittee. Therefore, work on the dry-cleaning code has been tabled, and at present there is no active interest in it. Unless someone volunteers to serve as chairman of a subcommittee to do the preliminary work that is needed, it appears that the work on dry-cleaning will be dropped entirely.

Sectional Committee Z8 is pleased to have been of service in up-dating the American Standard Safety Code for Laundry Machinery and Operations. The committee hopes that through use of this new standard the manufacturers of laundry equipment will design and offer for sale safer machinery, laundries themselves will adopt the safety recommendations in their operations, and all will benefit greatly as a result of fewer industrial injuries and greater productive capacities.

The Company Member Conference Spring Meeting

B. Scott Liston
CMC Chairman

CONSIDER that you have just been appointed a member of the top management group which has the standards activity in your company as one of its responsibilities. This was the challenge presented to a workshop session of company standards men during the Spring Meeting of ASA's Company Member Conference. The meeting was held June 1 and 2, at the Pick-Congress Hotel in Chicago. Accepting this challenge, members of the workshop groups were asked to report on what single factor they would consider most important in evaluating the company's standardization program to justify its continuance.

This interesting session, reported in full in this issue (page 269), represented only one of the problems of special interest to standards administrators taken up during the meeting.

B. Scott Liston, standards administrator, Diamond Alkali Company, Cleveland, Ohio, and chairman of the CMC, presided at the opening session. The CMC members were welcomed to Chicago by **John Ward,** purchasing agent and chairman of the Board of Standardization of the City of Chicago. Mr Ward is himself a member of the Standards Engineers Society.

Since the Company Member Conference is made up of standards administrators of companies that are members of the American Standards Association, **Cyril Ainsworth,** deputy managing director of ASA, presented the new constitutional changes that will give the companies a voice in the government of ASA. To do this, the ASA Constitution has been changed and the Board of Directors is being reorganized, effective January 1, 1962. Company members will now have eight representatives on the Board. Terms of office will be four years, the terms of two of the representatives to expire each year. On behalf of ASA, Mr Ainsworth invited the CMC to make nominations from which the Board could select the companies to be invited to membership.

One of the objectives of the American Standards Association, Mr Ainsworth pointed out, is to encourage standardization as a basic company activity. Standardization affects the national economy and everyone benefits from it, individual companies, particularly. As the primary units of the economy, they reap a large share of the benefits from standardization at all levels. Mr Ainsworth suggested that, in view of its increased responsibilities, the CMC may wish to re-evaluate its objectives and operations. There may be activities of direct interest to the CMC that are not being handled by any other group, he pointed out.

IN A PAPER entitled "Compressed Gas Cylinders and the Grace of God," **Allen L. Cobb,** director of Industrial Safety, Eastman Kodak Company, called for greater control to prevent accidents due to mistaken identity in use of compressed gas cylinders. Mr Cobb's talk is published on page 273 of this issue.

ON THE THEME Safety Standards in Action, Underwriters' Laboratories' activities in providing safe design and use of today's many new electrical devices and appliances were described. This work is particularly important because of the widespread use of these new electrical marvels, both in industry and in the home, the speakers pointed out.

D. L. Breting, superintendent of label service, spoke on the Laboratories' testing services. Responsibility for the elimination or reduction of fire and accident hazards of electrical appliances falls on three groups, Mr Breting said. These are (1) the manufacturers of the equipment; (2) the testing organization that provides the established safety requirements; and (3) the local enforcing authority, acting in the public interest.

A proposed standard for an electrical product is drawn up by one of the engineers within the Underwriters' Laboratories, Mr Breting explained. At present there are 228 published UL standards for various products, some of which have been approved as American Standard. In most instances, a draft is submitted to an "Industry Advisory Conference" composed of manufacturers and engineers selected for their knowledge of the product. Usually there is a meeting between the laboratory engineers and the conference to discuss the draft and arrive at agree-

W. P. Hogan, Jr, describes the contribution of government inspection bureaus to safe use of electrical equipment. C. A. Mattingly sits at left; D. L. Breting at right.

ments. A revised draft is then sent for comment to all manufacturers who subscribe to the Underwriters' Laboratories' service on that class of product. The draft is also sent to whichever council of the Underwriters' Laboratories is concerned with the equipment under consideration.

Underwriters' Laboratories makes a real effort to get comments from those substantially concerned and to take these comments into account, Mr Breting said. In the final analysis, however, UL standards represent the best judgment of the UL staff as to what specifications are needed to assure safe performance of the product. Every effort is also made to revise UL standards when necessary in order to keep them up to date. These standards are used as a working tool by the UL engineers, as a yardstick to measure the acceptability of products submitted by manufacturers for approval.

Any product submitted for approval is tested by the UL engineers for compliance with the standard, Mr Breting pointed out. If the product does not comply with the standard, the engineer submits a letter of criticism to the manufacturer with the idea that possibly changes may be made so that the product will conform. When the product is found to conform, the engineer prepares a report describing the results of his examination and test. If the product is new or incorporates features not encountered before, the report is referred to the UL Electrical Council which evaluates the adequacy of the investigation.

Two basic inspection services are available for follow-up: (1) re-examination; (2) label service.

Under the re-examination service, Mr Breting said, products are inspected at least once each year and more frequently if necessary. The manufacturer's name and the model or catalog number of the product are published in the UL listing and the manufacturer is permitted to use UL re-examination service markers.

The label service gives the manufacturer authorization to attach UL labels to his product, the use of the labels being controlled by means of an inspection service provided by the Laboratories.

SPEAKING on design, **C. A. Mattingly** described how a manufacturer makes use of UL standards to make sure the products a company designs and sells are safe for the public. Mr Mattingly is staff specialist, Warwick Manufacturing Corporation, Chicago.

The vast number of safety ideas and procedures contained in UL standards developed over the past 40 years contribute immeasurably to public safety, said Mr Mattingly. Standards should be minimum requirements consistent with sound industrial practice and must remain flexible. They should not be made mandatory. Wide latitude should be permitted for variations in design, and for production of a superior quality, always providing that the public is not endangered.

The manufacturer assumes a certain amount of responsibility when he decides to market a device, Mr Mattingly pointed out. It is his responsibility to procure quality parts and to control the assembly by means of inspection so that the product will be safe for the public to use over a period of years. The manufacturer should furnish correct servicing instructions to warn the user of unsafe practices in use and repair. Wherever possible, a manufacturer should use as component parts those products such as switches, material, wire heaters, sockets, line cords, and so forth, which have been listed by Underwriters' Laboratories as safe, Mr Mattingly said. This is a real help in assuring adequate safety in the final assembled product, he commented.

As an example of the work being done, Mr Mattingly referred to the implosion hazard of a television picture tube. A large-size tube may provide an energy release of four tons when it is broken. Because of this, the UL standards provide for an implosion shield of tempered glass to be placed in front of the tube. Until recently, it has been difficult to test the quality of the tempered glass used for this shield. Now, each piece of tempered glass can be tested with a polariscope which will show whether any weakness exists in the glass and will locate defects due to the tempering process.

In order to prevent electrical shock and fire haz-

ards, standards call for accelerated life tests and special aging tests to be sure that the product will still be safe during the reasonable life of the equipment. Tests to simulate load surge, high voltage, and other unusual conditions must be made in order to gain approval of the Underwriters' Laboratories for television and radio equipment. By testing the product and informing customers and the general public that the devices tested provide adequate safety to the user, the UL can greatly help a company that spends time and serious effort in order to make a safe product, Mr Mattingly pointed out.

THE WORK DONE by local government inspection bureaus to enforce safety codes for the protection of the public, and the way in which the bureaus work with Underwriters' Laboratories, was described by **W. P. Hogan, Jr,** chief of the Electrical Inspection Bureau, Chicago.

Mr Hogan explained that he represents a governmental body concerned with the enforcement of electrical standards. Some 77 years ago, just two years after Edison had invented the electric light, Chicago allocated funds for a man to "investigate and inspect the new-fangled electrical apparatus." This was the beginning of electrical inspection in Chicago. In 1897, the first standard for electrical installation was written through the combined efforts of the National Board of Fire Underwriters, The National Conference on Standard Electrical Rules, and several other organizations. In the early 1900's, the City of Chicago followed with its own rules and regulations for the installation, alteration, repair, and maintenance of electric wiring and apparatus. This original set of rules has been revised and amended several times since then and is, at present, undergoing a further revision. The Chicago Code is intended to provide a minimum standard for fire and life safety and not to provide for the adequacy or convenience of electrical equipment, Mr Hogan explained.

His problem is with the irresponsible manufacturer who makes an unsafe product and endeavors to sell it to the public at a low price, Mr Hogan said. Through the efforts of his department and other state and municipal inspection services the reputable manufacturer can be protected from such cut-rate competition by irresponsible manufacturers. Therefore, a strong and active Bureau of Electrical Inspection is a tremendous asset to responsible manufacturers, he declared. Such a bureau regulates the practices of all manufacturers and influences those who do not subscribe to UL standards of their own volition to submit their products or equipment for approval. If Underwriters' Laboratories does not have an appropriate standard but the responsible manufacturers have developed a standard of their own, this standard is used by the electrical inspectors as a basis for acceptance or rejection.

For this safety program to be effective, Underwriters' Laboratories, the manufacturers, and the inspectors must work hand in hand to assure the public that they can purchase products that are free from hazard, Mr Hogan declared.

"STANDARDS FOR COMMUNICATION" was the subject of an illustrated talk by **Joe W. Coffman,** president, Tecnifax Corporation, Holyoke, Massachusetts. Mr Coffman used slides to point out how easily words can be misunderstood and how difficult it is to make sure everyone is thinking of the same meaning for the same word. Communication is one of the most important factors separating man from other animals, he commented, but one of the greatest problems of communication is "the illusion that it has been achieved."

There are two possible approaches to the communication problem, Mr Coffman said. One is the "intentional method," used by Hitler in *Mein Kampf*. In this method you turn your back on facts, only keeping in mind what you want someone else to believe, and using any method you can to get others to believe what you want them to believe. This results in war, bigotry, and superstition, he commented. The second way is the "extensional method" proposed by Sir Francis Bacon. With this method it is necessary to face facts, ask questions, and try out the facts, thus obtaining inferences which today would probably be called "feedback." Using the facts in this way gets desirable results and leads to understanding and peace, he declared.

DURING THE MEETING, **W. L. Healy** described

Joe W. Coffman uses props to illustrate his views on communication and the "illusion that it has been achieved."

H. B. Wortman speaks on programing automated design. At table are Charles M. Wright and G. L. Godwin.

the cross-indexing work he is doing on comparable military and industry standards. His findings are reported each month in THE MAGAZINE OF STANDARDS. (See page 275.)

"OUR CHANGING INDUSTRY" was discussed by **Charles M. Wright,** executive director, Helical Washer Institute. One of the greatest challenges in the evolution of manufacturing practices has been in industrial design, he said. The ever-expanding scope of design operation has opened the way for predetermined quality control as well as automated assembly. In the past, suppliers have mostly developed their own product. Today, industrial design tells the suppliers what to make and how to make it. Changing models, availability, and field service requirements all contribute toward making interchangeability a design factor.

In an endeavor to hold the discussion within significant limits, Mr Wright referred specifically to the selection of design requirements for fastener applications. Fasteners represent an important part in the paperwork involved in releasing parts, planning, estimating, purchasing, and other engineering functions. The multitude of new products in the fastener industry makes laboratory investigation necessary to compare or to prove the strength and quality of the various products, he said.

Mr Wright questioned whether, in our struggle for design excellence, the common, available item may be overlooked even in those cases where special, critical, laboratory-proven parts are not required. May designers of modern mechanical products be so conscious of vibration problems that they sometimes overlook the basic engineering principle of static loading, for example? He wondered if, in our eagerness to prove the abilities of a new product, we may overlook or neglect such basic considerations as, possibly, using a standard fastener, free from such requirements as special estimates, special investigation, special liaison, special controls, special assembly operations, and so forth. Quoting from the final conclusions of a paper on "Loosening of Bolted Joints by Small Plastic Deformations,"[1] Mr Wright suggested that a draftsman's responsibilities cover applications within certain minimum loads and maximum initial tightening loads, and that he be responsible for adequate bolt diameters and a margin of safety where tightening operations cannot be accurately controlled. On the other hand, the ability to predetermine the amount of torque required to develop the necessary tension in a bolt has proved to be a stumbling block in design. Because of the many variables encountered during manufacture and assembly, it is difficult to issue adequate instructions. Actually, applied torque is transferred through the bearing surface of the fastener head, the nut face, and the thread flanks. If, therefore, variables are held to a minimum in these areas, the designer will go a long way toward effectively controlling his instructions concerning the torque. Mr Wright recommended further that the draftsman should select parts and materials which improve his ability to control these conditions.

Every fastener test program makes use of a hardened thrust bearing for recording the transfer of torque into fastener tension, Mr Wright recalled. Since this provides the uniformity necessary in a test program, he asked why it often seems to be overlooked by the draftsmen in component design.

Mr Wright believes that general-purpose items such as those covered in the American Standard on Lock Washers, B27.1-1958, can be a help in providing the "lowest unit cost" of assembly in a majority of applications.

H. B. Wortman AND **G. L. Godwin,** both of the Westinghouse Electric Corporation, spoke on the subject of programming automated design. Mr Wortman is advisory engineer, Assembled Switchgear and Devices Department, and Mr Godwin is advisory engineer, Large Rotating Apparatus Department. Five years ago, they said, if an engineer had been asked "Can stored program computers develop motor or switchgear design?" a quick answer would have been negative. However, often it would have been found that the greater part of the designer's time was being

[1] "Loosening of Bolted Joints by Small Plastic Deformations" by Associate Professor O. A. Pringle, Mechanical Engineering Department, University of Missouri, presented at the winter annual meeting of the American Society of Mechanical Engineers in November 1960.

spent not on creative activities but on logical analysis. Today, they said, decisions that follow each other in an inevitable fashion can be programmed. They showed that computers can accomplish the logical part of apparatus design, and described a successful effort to automate a manual drafting operation. They explained this as follows:

There are two distinct approaches to apparatus design. In one, the ultimate assembly may be unique but the parts are already available. Assembled switchgear is an example. In the other, it is necessary to develop the design completely, in detail, to meet specified physical demands. Capacity requirements may dictate the size and shape of the component parts, for example; although these parts may effectively serve the same function, they may differ in size and shape between the units. Rotating machine design is an example.

These two design approaches have yielded to two different programming methods. The one, for switchgear, is essentially data processing where parts are searched until a proper match between the key and the piece is established. The other, for rotating machines, is a "problem-solving" approach where performance requirements are analyzed through a survey routine until the optimum design is developed.

In the case of the switchgear program, the output has to be presented to the customer and manufacturing groups in accustomed format; this means in engineering drawings, requisitions, punch instructions, etc. Conversion of business machine output into this format is accomplished through a photographic process which permits adding fixed information to the variable-order output.

LEFT: Clifford W. Straitor, chairman of the workshop session on Management Evaluation of a Standards Program.

BELOW: Lt. Col. H. T. Dykman answers questions from the audience. Robert F. Franciose, chairman of session, sits at left.

Design is considered by many to be an art rather than a science. This probably is because it has been impractical to eliminate the need for human judgment backed by years of experience. Now, as computers are assigned more and more engineering design work, a transition is evident from design by judgment to design by logic. Westinghouse engineers have discovered this as they have successfully applied digital computers to the production design of complete equipment lines.

If the machine can be used in preparing drawings, can it plot an irregular shape on the drawing? This was one of the questions. Mr Wortman replied that their machines can only draw rectangles and straight lines. Other units are available, he believes, such as a cathode ray tube, which can be used to draw curves.

The speakers were asked what had been their experience, or how did they make their decisions, to put problems on a computer? In reply they said that they selected three men, one a designer, one a computer specialist, and one who was neutral on the subject. They had determined how many draftsmen were working on drawings, bills of materials, and other detailed work for each problem. For instance, in one design it might have been necessary to find and list over 800 parts. The decision was made on the basis of direct labor costs. In the two cases they used as examples in their talks, they found that this cost could be cut in half and, therefore, it was a justifiable investment. On some of the other problems investigated they had decided there were not sufficient cost savings to justify putting the problems on computers.

"Problems Confronting the Military and Industry Concerning Proprietary Rights" was the subject discussed by **Lt. Col. H. T. Dykman,** USAF, Headquarters, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Colonel Dykman explained that he was discussing the document "Armed Services Procurement Regulations," particularly section 9.2 on Proprietary Data. He emphasized that he was talking about engineering data, such as blueprints and specifications, as distinguished from technical data, such as maintenance manuals and operating manuals. Proprietary data can be defined as a manufacturer's private information, such as trade secrets, chemical compositions, and manufacturer's tolerances, he believes. In certain instances the Air Force has even accepted sources of supply as a manufacturer's secret.

Pointing out that the Department of Defense needs certain equipment and hardware and that industry needs the contracts, Colonel Dykman made a plea for close cooperation. He suggested as one basis for understanding: What industry develops is theirs; what the military develops belongs to the government; and what they cooperate in developing should be subject to discussion for a mutually satisfactory arrangement.

Explaining that he realized that some manufactur-

ers do not want the military to give their manufacturing information or blueprints to a competitor, Colonel Dykman suggested two avenues of approach. One is for a company to make an interpretation of the situation and tell the government what it understands the interpretation to be. The second is to ask for a deviation from the standard. Each government contract has a number and this number must appear on drawings. When the military give out copies of the drawings, he explained, they observe the contract number on the drawings and go back to the original contract to see whether or not any agreement has been reached concerning distribution of the drawings. When the military ask that an old drawing be redrawn, there may be a question as to which contract clause applies, either the new terms or the old terms. Under these circumstances, they would have to be governed by the contract number shown on the drawing. It is important, therefore, to see that the proper number is on the drawing.

Colonel Dykman believes that it is important in certain cases for industry and the government to get together and come to agreements concerning details. It is highly important, in his opinion, for industry to get the right person to make the decisions. He suggested that, in general, the information and decisions needed by industry can be obtained from the government contracting officer. He urged industry to send someone for such a conference who has the power to talk authoritatively and to make decisions for the company. Such a person should know which items he can decide and which items are of such importance that he must go back to his own company to get a decision. A person who has authority to make decisions will be able to come to an agreement with the government in the shortest possible time. For instance, in certain cases the governmental procedure for contracts calls for certain facts or requirements. If industry comes in with a reasonable alternative, he believes that the military will try to accept it.

Reprints of current articles in THE MAGAZINE OF STANDARDS can be ordered in quantities of 100 or more copies, if order is received within four weeks of publication date.

The fact that certain provisions in the military regulations require information which contractors must obtain from vendors is a problem at the present time, Colonel Dykman said. If a contractor has to meet a delivery date and cannot obtain this information from the vendors, there may be some way for the military and the contractor to get together for a reasonable solution, he believes. In many cases, the military needs information in connection with items purchased because of the problem of repair, he explained. However, although many drawings may be needed with the original contract, it may only be necessary to reproduce one percent of these drawings to solve the problem of repair parts. The military will try to purchase simple items, such as nuts and bolts and noncritical items needed for repair, by competitive bidding, Colonel Dykman said, but his opinion is that the military will try to go back to the original manufacturer for detailed, sophisticated parts. If the contractor can no longer supply these parts, then the military may undertake to make the parts themselves or submit them to competitive bids.

In this entire situation, the most important point, in Colonel Dykman's opinion, is for the military and industry to cooperate and try to understand each other's problems.

CHAIRMEN of the sessions during the CMC meeting were Ray J. Abele, standards engineer, Burroughs Corporation, Detroit, Michigan; Clifford W. Straitor, standards engineer, The Detroit Edison Company, Detroit, Michigan; Bernard W. Bace, head engineer, Standards Section, American Oil Company, Whiting, Indiana; William H. Old, director of purchasing, The Babcock and Wilcox Company, New York, N.Y.; and Robert F. Franciose, Standards Division, General Electric Company, Schenectady, New York.

Following the formal meetings, the members of the Conference divided into two groups to visit the Manufacturing Research Plant of the International Harvester Company, and the Underwriters' Laboratories.

The next meeting of the Company Member Conference will be held during the Twelfth National Conference on Standards at Houston, Texas, October 10-12. The CMC will sponsor Session 2 on the Philosophy and Practice of Standardization, Tuesday afternoon, October 10.

Bernard W. Bace, chairman of the session on Standards for Communication, gets the program off to an eager and smiling start.

MANAGEMENT EVALUATION OF A STANDARDS PROGRAM

Introduction to the Workshop Session

by GEORGE F. HABACH
Vice-President of Administration
Worthington Corporation

SINCE 1957, many manufacturers have experienced an increase in business volume, but this has often been accompanied by a decrease in earnings. This is contrary to the normal concept of economics which indicates increased earnings from an increase in volume.

The reason, of course, is the cost-price squeeze which results from the relatively stable market price of the finished product, a corresponding stable cost of the purchased materials from which the product is made, but with increasing labor and operating costs, such as taxes and services. Management has tried to overcome this squeeze by increased sales promotion and by intensive cost reduction programs. Many companies have found that the results of these efforts have not kept pace with the increased labor and service costs, and, hence, the attrition of earnings.

For the immediate future, significant price increases should not be anticipated. Therefore, the effort to reduce cost will continue and may be augmented. It has become a continuous and formalized effort in most companies and involves every segment of the business. The effort includes the closing or consolidating of plants or departments, capital expenditures for more productive machinery, improved manufacturing processes, better production control, increased inventory turnover, extensive changes in accounting, modifying clerical and service procedures, reduction of indirect labor and supplies, the redesign of product lines for cost reduction, new product developments based on building block or modular concepts, and even such minor but significant things as reducing the width of scotch tape or using regular mail in place of air mail on Fridays. Indirect personnel have come in for special scrutiny. The reductions have often started at the vice-presidential level and worked down through the organization. The objective of all of this has been an increase in over-all productivity.

While much of this improvement has been basically achieved by utilizing standardization techniques, the activity has been so widespread throughout the organization, and often done on a crash basis, that frequently it has not been so recognized by management or the participants. In some cases, the formal company standards program, and, perhaps, some members of the standards department itself have felt the axe, as this activity shows on the budgets as indirect cost, and indirect cost in any form has recently been questioned.

About five years ago, I made a survey of the Annual Reports of a number of leading manufacturing companies and found specific mention, in all except one, of the standards programs under way. It appeared to be just as important to mention this activity, and its portent for the future, as to expound on the research program. In looking over an even more extensive list of Annual Reports for 1960, I found that only one mentioned standardization activities. This, in my mind, is an indication that the top management has not fully recognized the true concept of the basic techniques which have made most of the cost reduction programs possible. It may also be that some of the work done on a crash basis may not have the broad considerations a full use of standards procedures will ensure, and, hence, the expected savings may not fully materialize or may be short-lived.

For simplicity, we can divide the areas of standardization into two broad classes. The first is concerned with International (ISO), American, or industry standards; the second, with intra-company standards.

While activity on standards of the first class is expanding, progress is slow. The initiative for such standards frequently comes from the user who can make significant tangible savings through interchangeability, quantity purchases, assurance of uniform quality or performance, reduced inventories, and, therefore, brings pressure on the manufacturers or suppliers for common standards. The producers may be reluctant to work toward such standards because of the possible costs involved in redesign and retooling, and because they fear competitive advantages may be sacrificed. The prospect of increased use of the product and, hence, increased volume, is an intangible advantage and often this is their only incentive to participate. In the long run, everyone usually finds economic and practical benefits in the use of such standards. Tremendous potential savings are obtainable by increasing the scope and speeding up the procedures for such broad standards. The predetermination of the value of such work involves a reconciliation of the effect on both user and producer, and sometimes emotional factors becloud the true over-all economies. It is seldom possible to justify the need for such standards to management on a dollars-and-cents basis. Broad-gaged top management interest is absolutely essential.

Management evaluation of the second class, the intra-company standards, is more frequent but may be almost as frustrating. Numerous surveys have shown direct savings that can be credited to the standards activity ranging from $2 to $8 per dollar spent, with a probable equal amount for intangible savings. This would seem to be a potential that would assure the standards activity the strongest top management support. But. more often than not, this support is difficult to obtain.

Following is an outline of the essential factors management considers in evaluating any activity or program recommended for implementation. First, there must be a concise statement of the objectives or philosophy that will guide the activity. For a continuing program, it must be in broad terms so as to give long-range direction. Second, specific goals must be stated for achievement in a definite time period, usually one year or less. The goals form the basis for a detailed program involving specific

people, facilities, services, materials, schedules, and are usually presented as a budget, an organization chart, and a measurable and scheduled program. Finally, a statement of justification must be included so top management can judge if the funds, personnel, and facilities would be used to better advantage in a different area of the business. Management is normally faced with more problem areas than it can handle simultaneously. It must, therefore, assign priority to the most critical ones. A criteria of management performance is its ability to define and solve the critical problems in (1) the order of their priority, (2) at a rate within the financial capacity, and (3) at a rate at least equal to the rate at which new problems occur.

There is little the standards group can do about the astuteness of the top management, but it can take steps to keep them well informed so they can base their priority decisions on all of the facts.

Normally, intangible savings are given weight by top management if the savings are presented logically, are plausible, and without exaggeration. The forecast of tangible savings may be received with skepticism, especially if there is any suspicion of wishful thinking. A bit of obvious conservatism may be advisable.

Management appreciates a clear statement of the tasks to be performed, in measurable terms, so progress can be checked and the results evaluated. It will take programs more readily on faith if they start modestly, provide for frequent audits, and permit progressive modification, or even cancellation, as experience is achieved.

The standards activity must be especially careful that participating segments of the business are credited for everything accomplished. The standards group must be content to serve as the catalyst. The contribution of the catalyst will not be overlooked by management. The standards department should be quite modest when vocally explaining its achievements; "feedback" from the operating segments of the business carries the most weight.

In most multi-plant companies, it will often be found that standards achieved by consensus, and with usage non-mandatory, are not only given better over-all acceptance but prepare the way for further standards.

Management associations, and some professional societies, have not given the potential of standardization the publicity and recognition it deserves. In contrast, the National Association of Purchasing Agents and, more recently, the American Society for Quality Control have given this work strong support.

Engineers sometimes tend to go to extremes, using some standards somewhat dogmatically even at a sacrifice of good economics, or equally dogmatically avoiding certain fully justified standards as an implied restraint on their creative freedom.

Top management support of any corporate activity is necessary, and is especially vital for the standards program because it cuts across every important operation of the company. Top management must frequently take time away from "fire fighting" to familiarize themselves with the standards work, audit the results, and provide the counsel and support needed to encourage the whole organization to participate. Lack of such interest will be reflected by an equal lack of interest throughout the organization.

Management has much to learn, and the workshop session today will provide an important opportunity collectively to focus our experience and brainpower on this complex problem of evaluation. Hopefully, we will be able to prepare a summary outline which will serve as a useful guide to both management and standards engineers.

THE WORKSHOP SESSION—EVALUATION OF A STANDARDS PROGRAM

FOLLOWING Mr Habach's presentation, the meeting divided itself into ten groups for a workshop discussion of the situation and questions presented for discussion. After 25 minutes the recorders reported the results of the discussion in each group; a final summary of these reports was given by Mr Habach.

The Situation:

Consider that you have just been appointed a member of the top management group in your company which has the standards activity as one of its responsibilities. In this capacity, you must evaluate the standardization program to justify its continuance as it is or to recommend changes (increase or decrease in the activity, or reorganization), or elimination.

Question:

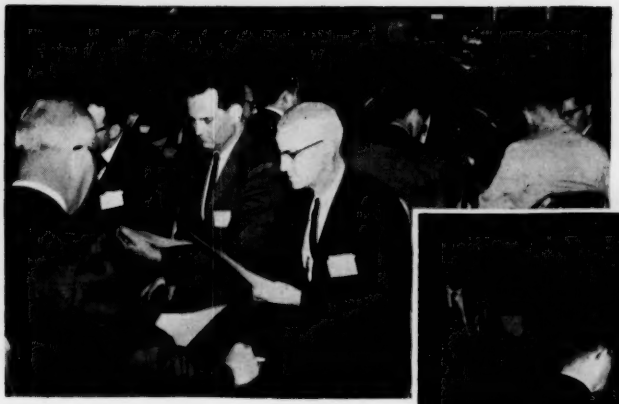
What single factor would you consider the most important in your evaluation? How would you measure it?

The recorders reported as follows:

Bernard J. Klim, Elliott Industries, Inc—Cost savings would be the most important factor in the evaluation. These savings would be measured by determining how much the variety of parts had been reduced through the standardization effort. Emphasis would be placed on (1) resulting discounts on quantity purchases; (2) simplification of material handling; (3) simplification of records and paperwork. Mention would also be made of the fact that this standardization effort would produce a system for using, tabulating, and controlling parts, with overall simplification in engineering, manufacturing, and administrative activities. Part of the evaluation would be presented in the form of support from manufacturing to the effect that standards are being used and that direct manufacturing savings are attributable to use of standards. This support should also back up efforts for further reduction in the variety of parts.

Vincent G. Iannoacchione, Pine Safety Appliances Company—Money would be the single factor in our evaluation. We would measure it by determining how well organized we are to effect money savings in reference to various facets of our organization. We would also call attention to the fact that company-developed standards are valuable for preserving the experience of key personnel who retire or leave the company for any reason. There is definite dollar value in this experience.

D. H. Siver, Crouse-Hinds Company—The degree to which the standardizing activity contributes directly or indirectly to the company's profit position would be the single factor. To measure it, we would first require goals be forecast on the most significant programs of the standards



LEFT: Workshop groups study the problem, "What single factor would you consider the most important in your evaluation [of standards]?" BELOW: Workshop leaders report on the results of their discussions as George F. Habach (seated at table) collects ideas for his summary of the groups' findings.

function related directly or indirectly to cost reduction and savings. At the end of the forecast period we would use reports to determine the progress and effectiveness of the program. Using a part-and-assembly or a materials program as a specific example, the indices would be (a) relative rate of release or introduction of new items; (b) changes in development engineering cost; (c) changes in inventory; and (d) service cost.

S. C. Hurd, National Cash Register Company—It is impossible to select only one factor. The factors we consider to be the most important are cost savings, degree of acceptance, and feedback. We would measure these by making surveys of the use of standards, by checking with purchasing for comparative data, by checking the reduction of inventory, by case histories, and by checking the serviceability of the standards.

Chester W. Krebbs, Philco Corporation—"Is our standardization profitable enough?" This is the question we consider to be the most important factor in evaluation of the standards program. We would measure this by checking the cost of standards versus savings or profits from standards. This would be checked by random sampling of recent standards. The costs to be considered would include the implementation cost, the cost of the time consumed, and the cost of the physical or mental changeover needed. The savings would include dollar savings, reduction in design costs, reduction in stock, and more effective use.

J. M. Goldsmith, Sheffield Division, Armco Steel Corporation—The percent of use of standards is the most important factor. This could be measured by an independent survey, not by the standards group, on the use of standards. Such a survey should determine whether the standards are realistic in reducing loss of time and material, thereby increasing the quality of the product and the productivity of the operation, which ultimately would bring dollar profits.

J. E. Ross, E. I. du Pont de Nemours & Company—It is generally recognized that a standards program is an effective cost reduction tool for increasing profits. Acceptance by management is retarded by difficulties in measuring tangible savings. It is suggested that the use of standards is the most important single factor. In order to measure this, methods should be established for determining the number of times standards are used for given periods. A system of spot checks should be devised. Use should be accepted as an index of effectiveness. Translation of this information into savings would be assisted, when required, by getting opinions on what would happen without standards. Use of standards would be increased and the stature and stability of the standards program would be enhanced, if management would recognize the program as a necessary operation similar to that of the comptroller's or the treasurer's offices.

R. W. Spencer, International Business Machines, Inc—The most important single factor is cost savings for the company, including the parent organization, and the company's many customers. This would be measured through (a) tangible savings—cost reduction measured by considering the manufacturing space and the material and labor required; (b) intangible savings—improved quality, safety, performance, and communications. These intangible savings are generally measured by feedback from line people, including production, inspection, stores, and accounting.

G. O. Newcomb, Ordnance Automotive Tank Command, U.S. Army—The answer to the question "Is the standards group necessary or is it just nice to have?" is the most important factor, the answer to be based on knowledge of the operation of the group and of the standardization available. This would be measured by savings in dollars through the use of standards that result from creativity within the company standards program. Each project or standard must be audited to show the savings, based upon knowledge of the costs of operation.

Harry E. Manning, American Radiator and Standard Sanitary Corporation—The most important single factor is whether the standards program has been profitable and whether it promises to continue to be profitable. This can be measured by comparing costs and quality of finished products through purchased parts, inventory costs, and similar factors both before and after the standards program. The authenticity of the records would be the important consideration.

SUMMARY OF WORKSHOP SESSION

by GEORGE F. HABACH

IN THE SITUATION presented, it is assumed that the first step was for the new member of top management to familiarize himself fully with the standards activity that is now his responsibility—its objectives, goals, organization procedures, programs, schedules, and budgets. The

standards activity must justify its cost. Its work must be measured, evaluated, and audited.

While different groups selected different factors as most important, they all fell into two broad categories.

1. Standards must contribute to the customer acceptance of the product or service, and, thus, to the growth and profitability of the business, by:

(a) Achieving an adequate relationship between price and cost.

(b) Maintaining quality, performance, interchangeability, and safety.

(c) Contributing to lowered cost of installation, ease of maintenance, "foolproof" operations.

2. Standards must contribute to the effective and efficient internal operation of the business, by:

(a) Reducing cost.

(b) Preserving the company's "know-how."

(c) Facilitating communications and common understanding of requirements.

(d) Providing stability, uniformity, and efficiency.

While a different procedure for measuring results is necessary for each factor, in general it will be necessary to look for:

(a) Existence of forecasts and schedules, followed up with periodic performance reviews.

(b) Audit of actual, predicted savings (tangible and intangible vs costs) for each project.

(c) Evidence of creativity and leadership within the standards group and cooperation with all other segments of the business.

(d) Flexibility of the standards as evidenced by changes as needs change, and periodic review of each one to be certain it is up to date.

(e) Percent of use of the standards by the operating segment and "feedback" as to their effectiveness.

(f) A backlog of projects awaiting evaluation and scheduling.

HARDNESS CONVERSION TABLES APPROVED AS AMERICAN STANDARD

by R. H. HEYER
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Armco Steel Corporation, Middletown, Ohio

THE NEW AMERICAN STANDARD Z76.4-1961[1] is a collection of the standard hardness conversions now available for specific types of metals, with introductory explanatory material and precautions in the use of conversions that are applicable to all the tables that formerly appeared in Z76.1-, Z76.2-, and Z76.3-1955 (ASTM E 48, E 93, and E 33). There are no changes in the numerical values. As hardness conversion tables are developed for other classes of metallic materials, it is intended that they will be added to this standard.

Indentation hardness tests are made using indenters ranging from a sharp, pointed diamond to a 10-mm diameter hardened steel ball, and test loads from 1 to 3000 kg. Nevertheless, for a given type of metal it is possible to establish empirical conversions from one scale to another. Such conversions are sufficiently accurate for most purposes. Where hardness is a critical feature in a product specification, the hardness tests should be made using the indicated hardness scale, so that conversions will not be required. This may not be possible if, for example, Brinell hardness limits are given in a flat product specification where the thickness may range down to 1/16 in.; or if Rockwell B limits are given in a sheet specification where the thickness may be as low as 0.010 in. Specification writers should be sure that the hardness scales conform to the limitations of standard methods of making the hardness tests.

Hardness conversions for special materials—steel, nickel and high-nickel alloys, and cartridge brass—were the first to be standardized, as American Standards Z76.1-, Z76.2-, and Z76.3-1955. If a single set of conversion tables were used for these and all other metallic materials, the conversion errors would be greater. The primary reason for differences in hardness conversions between materials is the fact that there are differences in their capacity for hardening by cold work. Indentation hardness tests subject the metal to various degrees of plastic deformation. A 30-kg Rockwell Superficial 30T test makes a smaller permanent indentation in a given material than a 100-kg Rockwell B test. When two different materials having low and high work-hardening capacities are tested, the difference in amount of plastic deformation in the 30- and 100-kg tests becomes an important factor. For example, a carbon steel and an austenitic stainless steel both test 60 on the Rockwell Superficial 30T scale. However, the Rockwell B test is 74 for the austenitic stainless steel and 65 for the carbon steel, reflecting the higher cold work-hardening capacity of the stainless steel. It is evident that different conversion tables would be needed for these materials.

In general, metals in the soft annealed condition have the highest work-hardening capacities. Cold-working, as by rolling or drawing through dies, uses up some of the work-hardening capacity, so that the plastic deformation in the indentation hardness test has a smaller tendency to harden the metal.

Standard conversion tables are not available for several important classes of materials, such as austenitic stainless steels, aluminum alloys, and even carbon and low alloy steels in the "soft" or Rockwell B range. Work is underway in ASTM Committee A-10 on tables for the austenitic stainless steels. Other conversion tables will no doubt be developed where needed.

[1]American Standard Hardness Conversion Tables, ASTM E140-58; ASA Z76.4-1961, 30 cents.

GAS CYLINDERS

...and the Grace of God

by ALLEN L. COBB

Mr Cobb is director of Industrial Safety, Eastman Kodak Company, Rochester, N.Y. He delivered this paper at the Spring Meeting of the Company Member Conference of the American Standards Association, held June 1-2 at Chicago, Ill.

SINCE THE TITLE of this talk is a bit unusual, it demands explanation.

The title comes from a piece of one-half inch clear lucite plastic that has kicked around in my desk drawer for quite a few years. On it are etched the words—"By the Grace of God."

By now, most of you have realized that this has some connection with an accident—and with a miraculously narrow escape from serious injury or death. You are quite right—it does have to do with an accident; the accident involved a gas cylinder and the escape from death was truly a miracle.

Let's see what happened then in November 1952.

The experimental process we were working on involved the addition of a metal hydride to ether in a chemical reactor. Metal hydrides react rapidly with water, or even the moisture in the air, to result in ignition. The addition of the hydride to ether is therefore a tricky business and requires some special precautions.

The job was set up in a small corrugated-iron pilot building with a reinforced concrete barrier wall between the reactor and the operator. The atmosphere in the reactor was kept inert by filling all vapor space with nitrogen—the so-called "water-pumped" nitrogen which is free of oil contamination.

In order to charge the metal hydride, a gas-tight metal charging box was built with a front window of one-half inch lucite. The gauntlets of a pair of heavy rubber gloves were clamped in flanges in two openings in the box so the operator could put his hands into these gloves and manipulate the hydride cans. The cans were introduced into the charging box through an "air lock" with sliding gates.

Nitrogen was received in cylinders equipped with ASA No. 540 connections,[1] at that time the only way in which "water-pumped" nitrogen could be obtained locally. A receiving clerk placed cylinders in separated areas in the stock room.

Each day, six nitrogen cylinders were placed on a special skid which held them upright, and they were then transferred by lift truck to the pilot plant. The technician at the pilot plant had never had occasion to handle anything but nitrogen cylinders.

The trouble began when an oxygen cylinder was used somewhere in another plant near a spray painting operation. Apparently mist or overshoot from a spray painting operation coated this cylinder with a pale green color for one-half its diameter and its entire length.

Next, this cylinder got banged around so that most of the decal label that read "oxygen" was scrubbed off and only the letters "gen" were left.

As a contributing factor, this supplier painted oxygen cylinders orange, and nitrogen cylinders half orange and half aluminum paint. The aluminum paint, however, got scratched up pretty badly so that the aluminum color on most of his cylinders was pretty much obscured by iron rust.

Then, of course, the chain of errors began. The receiving clerk made a first mistake and placed this oxygen cylinder with the nitrogen cylinders. In due course, it was mounted on the special skid and sent, along with five cylinders of nitrogen, to the pilot plant.

The operator had no trouble hooking it up—after all, it had an ASA 540 fitting—and so he proceeded to charge metal hydride into the reactor with his charging box full of oxygen and ether vapor.

Nothing happened until he stepped from the platform in front of the charging hopper—and at this instant the ether-oxygen mixture exploded. Pieces of the hopper went over the operator's head and missed him by inches on both sides. Heavy piping and explosion-proof electric wiring was neatly sheared off

[1] No. 540 is the identification for cylinder valve outlet connections for oxygen, industrial and medical, as specified in American Standard B57.1-1957, Compressed Gas Cylinder Valve Outlet and Inlet Connections (CGA V-1). This standard has also been approved by the Canadian Standards Association as Canadian Standard B96-1957.

and the corrugated iron walls and roof were perforated.

A piece of plastic from the hopper window—the piece I keep in my desk—is the largest piece we found. The operator had no injuries beyond temporary deafness. He told us later that he felt fine but "his bed shook all night long."

Right now, someone may say that all this needn't have happened—the stock clerk made the mistake and that's all there is to it. Then someone may say that the technician should have noticed the error. Such answers don't impress us. One of our very definite safety policies may be summed up as "defense in depth." We do not like to depend solely on men—who can make mistakes—or on gadgets, which are subject to mechanical failure. Safety must make use of both methods—and in enough depth so that failures will not result in the ultimate accident.

That accident was nine years ago—what's happened since? And why do I speak to you on this subject this morning?

Just a few months ago, we made a survey of local suppliers. The table shows what the situation is today in Rochester. No less than five gases are supplied in cylinders with the ASA 540 connections—oxygen, nitrogen, breathing air, argon, and propane.

VALVE CONNECTIONS FOR COMPRESSED INDUSTRIAL GASES

	ASA Connection Recommended		ASA Connection Supplied by Vendor		
	Primary	Secondary	A	B	C
Air, Water Pumped	590	—	590	—	**540**
Argon, W.P.	580	—	580	**540**	580
Acetylene	510	300	510	300	510
Anhydrous Ammonia	240	—	—	—	—
	380	260	240	—	—
Chlorine	660	—	660	—	—
Carbon Dioxide	320	—	320	—	—
Helium, O.P.	590	350	590	350	350
Helium-Argon Mix	—	—	—	350	—
Hydrogen	350	—	350	350	350
Freon 12	620	—	660	—	—
Liquid Propane Gas	510	350	—	—	—
	—	300	510	510	**540**
Nitrogen, W.P.	580	—	580	580	**540**
Oxygen	**540**	—	**540**	**540**	**540**
Sulfur Dioxide	620	360	660	—	—

Just imagine, if you will, what would happen to the man who hooked up nitrogen to this airline respirator? Or to the man who used oxygen instead of air for work in a confined space where ignition resulted? How about manifolding oxygen and propane together?

Why not paint the cylinders?

As perhaps you know, bills were introduced in the Federal legislature for color identification following a disastrous accident in another company. It didn't get into the law, as it just isn't practical; too many colors and combinations are needed, and besides, every supplier of cylinders has his own color scheme.

Good labels? This isn't as easy as it sounds. The only label that's good for anything is one with raised letters that can't be obscured by paint. As you well know, you can't weld, braze, rivet, or screw a label to a gas cylinder.

A ring around the neck of the cylinder is a possibility. Such rings are used by some suppliers to identify their property—not the cylinder contents. One difficulty is that cylinders are changed from one service to another; changing these rings is a difficult job—much more so than changing the valve.

This, then, about boils down to using American Standard B57.1-1957. It's a good standard—we've had it for years—and if used, it will at least prevent the more serious mixups. This standard, for example, says that connection No. 540 must not be used for anything but oxygen. It provides connections for nitrogen that just don't allow any mixup with air or oxygen, or with fuel gases for that matter.

The Compressed Gas Association is sponsor for this standard; CGA endorses it and likes it.

Then, why isn't it used more than it is?

Frankly, this isn't a small problem—there is an enormous investment in cylinders on the part of suppliers. There is also a very large investment on the part of gas users—regulators, manifolds, and so on.

If suppliers were to change all their connections, users would have to replace or change over all their regulators. When users don't appreciate the hazard, you can understand their reluctance to rebuild all of this equipment.

What, then, are the answers?

First of all, users can bring pressure. For example, following our own experience that I've just described, we changed all of our nitrogen equipment to ASA 580 and then we requested our suppliers to use this fitting on all cylinders supplied to our plants wherever located.

Following our own experience, we worked actively with such organizations as the National Safety Council and the Manufacturing Chemists' Association. Through their efforts much has been accomplished.

This, however, is a never-ending job. Just a few months ago, and much to our chagrin, we found nitrogen cylinders with ASA 540 connections in the very area where the trouble all started. It was necessary to refresh the memories of our own people; the situation was quickly corrected, but it does demonstrate the vigilance that is required.

There is, of course, recourse to law. In this country we hesitate to do this. We believe that free men should be able to work out solutions to these problems without government compulsion. We also appreciate the inflexibility of the law. It isn't easy to change a law once it's in effect.

Today, all I hope to do is to indicate something of the nature of the problem, leaving the answer to others.

CROSS - INDEXING

Industry and Military Specifications and Standards

Reported by W. L. HEALY

Do you know of any case where an adequate, and comparable, industry standard or specification can be used for a military document? If so, you are invited to call it to the attention of W. L. Healy, staff engineer, American Standards Association. Mr Healy is cross-indexing and analyzing comparable industry and military specifications for the Bureau of Ships under a contract with ASA.

It is the thought that the materials represented by the industry standard are the standard, and more readily procured, materials. It is hoped that these industry standards and specifications which have been listed along with their comparable military documents in THE MAGAZINE OF STANDARDS may be used for procurement. However, the use for procurement of any of the published industry standards or specifications, especially in the area of critical application, is a matter for decision by the cognizant engineering office.

Following are recent examples of work performed under the contract. For other examples, see THE MAGAZINE OF STANDARDS, each issue beginning February 1961.

MIL-T-0020157A (SHIPS)
***cross index* ASTM A 106-60T**

MIL-T-0020157A (SHIPS)—TUBE AND PIPE, CARBON STEEL, SEAMLESS

Equivalent Areas: ASTM A 106-60T, grade A, is equivalent to MIL-T-0020157A (SHIPS), types A, B, C, D, and ASTM A 106-60T, grade B, is equivalent to MIL-T-0020-157A (SHIPS) type E.

The chemical and physical requirements are identical.

Permissible variations in outside diameter are the same for the ASTM specification, grades A and B, as they are for the mlititary specification, types A, B, C, and D. Type E permits a ±1.0%.

Divergent Areas: The military specification requires government inspection and check analysis for chemical composition. Check analysis under the ASTM specification is made only when requested in the purchase order.

(a) Flattening tests are required for each tube or pipe as rolled under the military specification MIL-T-0020157A (SHIPS). The ASTM specification requires that a test be made on one tube or pipe from each lot of 400 lengths 2 in. to 6 in. exclusive and on one tube or pipe from each lot of 200 lengths sizes 6 in. and over.

(b) MIL-T-0020157A (SHIPS), type E, is special and permits a ±1.0% tolerance in outside diameter for all sizes.

ASTM A 106-60T, grade B, its equivalent, permits a variation in outside diameter as follows:

Nominal pipe size (in.)	Permissible variations in outside diameter
⅛ to 1½ incl.	+.015 −.031
1½ to 4 incl.	+.031 −.031
4 to 8 incl.	+.062 −.031
8 to 18 incl.	+.093 −.031

ASTM A 106-60T is based on nominal wall thickness and provides that the minimum wall thickness at any point shall not be more than 12.5% under the nominal wall thickness specified. The military specification is based on minimum wall thickness.

Military specification MIL-T-0020157A (SHIPS) requires that all tubes and pipes ½ in. O. D. and over be identified with constantly recurring symbols, at intervals of not less than 36 in., in accordance with MIL STD 183. The symbol will contain the manufacturers' name or trademark and identifying designation of material:

"A 106A SMLS" for types A, B, C, and D.
"A 106B SMLS" for type E.

ASTM specification requires that each length of pipe be legibly marked, either by stencilling, stamping, or rolling. The information should contain the manufacturer's name or trademark together with A 106A or A 106B.

Exclusions: none.

Other Requirements: The procurement document should specify the ordering data and include sampling and inspection requirements as indicated in MIL-T-0020157A (SHIPS).

Sampling procedure and tables for inspection by attributes in accordance with MIL STD 105.

Preparation of steel products for domestic shipment (storage and overseas shipment) in accordance with MIL STD 163.

HH-I-523a
cross index ASTM C344-60T; C345-60T

HH-I-523a—INSULATION BLOCK, PIPE COVERING AND CEMENT, THERMAL CALCIUM SILICATE (FOR TEMPERATURES UP TO 1,200 F)

Equivalent Areas: ASTM C344-60T, covering composition, size, dimensions, and chemical and physical properties of calcium silicate block-type thermal insulation intended for use on surfaces operating at temperatures of 1,200 F is equivalent to federal specification HH-I-523a, class 1, and could be used for procurement.

The chemical requirements "principally composed of reacted hydrous calcium silicate reinforced with mineral fibers" are equivalent.

The physical requirements for the two specifications are the same.

The dimensional tolerance for both specifications is ± ⅛ in.

Both specifications provide that the following ASTM test methods be used for determining the following values:

(a) density—ASTM C303-56
(b) compressive strength—ASTM C165-54
(c) flexural strength—ASTM C203-58
(d) linear shrinkage—ASTM C356-60
(e) thermal conductivity—ASTM C177-45

ASTM C345-60T, covering the compositions, sizes, dimensions, and chemical and physical properties of calcium silicate thermal insulation for pipes, intended for use on surfaces operating at temperatures up to 1,200 F, is equivalent to federal specification HH-I-523a, class 2, and could be used for procurement. The chemical and physical requirements are comparable.

Both specifications provide that the following ASTM test methods be used for determining the following values:

(a) density—ASTM C302-56
(b) thermal conductivity—ASTM C335-54T
(c) linear shrinkage—ASTM C356-60

Divergent Areas: none.

Exclusions: The ASTM specification does not cover requirements for cement, federal specification HH-I-523a, class 3.

Other Requirements: The procurement should specify the ordering data and include sampling and inspection requirements as indicated in federal specification HH-I-523a.

Marking for shipment and storage should be in accordance with MIL-STD 129.

L-P-590
cross index ASTM D 1248-60T

L-P-590—PLASTIC COMPOUNDS, MOLDING AND EXTRUSION, POLYETHYLENE

Equivalent Areas: ASTM D 1248-60T covers requirements for polyethylene molding and extrusion compounds, certain types, grades, and classes of which are equivalent to certain types in federal specification L-P-590.

ASTM D 1248-60T, type 1, grade 3 or 4, class A, covering an application for general service with natural color, is equivalent to federal specification L-P-590 type 1, grades 2 or 3. The property values are comparable. The ultimate elongation, including cold drawing, is 400 psi for both specifications. The brittleness maximum temperature and specific gravity are comparable.

ASTM D 1248-60T, type 1, grades 3 or 4, class A, for dielectric application, with natural color is equivalent to federal specification L-P-590, type II, grades 4 or 7.

The brittleness maximum temperature (−60C) and ultimate elongation (400%) are the same. The dielectric constant (2.35), dissipation factor, maximum, 50 to 110 megacycles/sec (0.0005) and specific gravity are comparable.

ASTM D 1248-60T, class B, type 1, grades 3 or 4 for dielectric application with color are equivalent to L-P-590, type II, grade 5. The specific gravity, ultimate elongation, brittleness temperature, and dissipation factor are comparable.

ASTM D 1248-60T, class C, type 1, grade 3 or 4, covering black weather-resistant application is equivalent to federal specification L-P-590, type III, grades 6a, 6b, and 8. The specific gravity, ultimate elongation, brittleness temperature, dissipation factor are comparable.

Divergent Areas: ASTM D 1248-60T lists type 1, grade 3, with a tensile strength of 1500 psi and grade 4 with 1800 psi, while federal specification L-P-590 requires 1400 psi for all grades except grade 1 which requires 1200 psi.

The dielectric constant for ASTM D 1248-60T, type 1, class C, grades 3 and 4, is 2.75 and the dissipation factor is .005, while the dielectric constant for federal specification L-P-590 is 2.50 for type III, grades 6a, 6b, and 8, and the dissipation factor is .003 for grade 6a, and .005 for grades 6b and 8. The brittleness temperature maximum in the ASTM specification for type 1, class C, grade 3, is −55C and −70C for grade 4, while the federal specification L-P-590 lists a maximum temperature range of −50C to −52C for grades 6a, 6b, and 8.

Exclusions: ASTM D 1248-60T, type I, grades 1, 2, type II, grades 1, 2, and 3, and type III, grades 1, 2, and 3, are not included in federal specification L-P-590.

Other Requirements: The procurement document should specify the ordering data and include sampling and inspection requirements as indicated in federal specification L-P-590.

The following ASTM methods are used for determining values:

Measuring flow rates of thermoplastics by extrusion plastometer—ASTM D 1238-57T.
Tensile strength and ultimate elongation—ASTM D 638-60T.
Brittleness temperature—ASTM D 746-57T.
Dissipation factor dielectric constant—ASTM D 150-59T, or ASTM D 1531-59T.
Density—ASTM D 1505-60T or ASTM D 792-60T.
Carbon-black content in ethylene plastics—ASTM D 1603-60T.

Colors shall be in accordance with military standard MIL STD 104.

Packaging and packing for levels A and B should be specified in the ordering data. Packaging and packing for level C should be in accordance with commercial practice.

In addition to any special markings required by the contract, marking for shipment shall be in accordance with federal specification PPP-P-31.

• NEWS BRIEFS

THE MOST IMPORTANT actions on safety taken during the past ten years include a number in which American Standards and ASA are involved. Under the title "A Decade of Safety Dates," (*Safety Standards*, July-August, 1961) the following have been selected by the U.S. Bureau of Labor Standards as the most significant safety developments during this decade:

1951—Examination of state safety codes began [by the Bureau of Labor Standards]. The first analysis compared provisions of the American Standard Code on Woodworking Machinery with corresponding state safety requirements.

1952—The President set eight industrial safety goals for the nation: Better accident reporting and analysis; better machine guarding at the source; safety eduction in schools, colleges, and plants; a safety organization in every company; greater worker participation in safety; greater uniformity of state safety codes; more public employee safety; better public understanding and support of accident prevention.

1953—Increased height of American male recognized in revised American Standard Safety Code on Mechanical Power-Transmission Apparatus. Realization of need to safeguard taller workers reached during World War II. Old 5 ft 6 in. to 6 ft 6 in. minimum standard for guarding all transmission equipment was upped to 7 ft.

1954—The President's Safety Award was established to honor Federal agencies for safety accomplishment.

1955—Italy called First World Safety Congress in Rome. Representatives of 33 nations exchanged safety experience. Radiation protection was discussed at First World Atoms-for-Peace Conference in Geneva.

1956—The American Standards Association was directed [authorized to initiate projects] to develop standards for nuclear energy.

1957—Interstate Commerce Commission issued transportation safety code for migrant workers. The action followed a series of fatal highway accidents.

1958—"Dawn of the Space Age" provided setting for the 1958 President's Conference on Occupational Safety. Maritime workers were protected by enactment of new safety legislation.

1959—AFL-CIO held first conference on Safety and Health.

1960—The Commissioner of Labor Statistics recommended three-fold safety emphasis for the '60s . . . "revamp our accident prevention procedures" to safeguard the rising proportion of young people and women in the labor force; "expand our safety activities" in construction and service industries; "develop new techniques to insure the safety of the rapidly growing group of professional and technical workers."

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THE AMERICAN STANDARDS Association has been assigned the secretariat for an international technical committee on freight containers, ISO/TC 104, just approved by the International Organization for Standardization. The scope of the committee's work will be "standardization of an integrated series of freight containers for universal interchange between marine, railroad, air, and highway transportation carriers." It will include terminology and definitions, specifications for performance, dimensions and tolerances, methods of measuring, methods of handling and securing, and marking of containers.

ISO/TC 104 will coordinate its work with that of ISO/TC 51, Pallets for Unit Load Method of Materials Handling.

National standards bodies of 12 countries are participating members of ISO/TC 104: Australia, Czechoslovakia, France, Japan, Netherlands, New Zealand, Norway, Poland, Switzerland, United Kingdom, USA, and USSR.

The first meeting of the new committee is being held in New York, September 11-14, 1961.

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HARRY C. PLUMMER, director of engineering and technology of the Structural Clay Products Institute, has been made a Fellow of the Construction Specifications Institute, the first non-architect to receive this honor. He has been secretary-treasurer of the CSI for the past six years.

Mr Plummer is active in the national standards program on behalf of his industry. He is a member of ASA's Standards Council and chairman of Sectional Committee A62, Coordination of Dimensions of Building Materials and Equipment. He is also a member of a number of committees on building code requirements.

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OOPS!

That's what's happening to government precision-made electronic equipment, some of it destined for missile use, now being dropped on purpose by an ingenious machine to test shock characteristics.

Alarmed at air-borne electronic equipment failure in World War II under stress and strain, the government designed a shock-testing machine that does on the ground what take-offs, landings, and rough air do to electronic equipment in aircraft.

Leaving nothing to chance, federal agencies then joined with trade and technical societies to develop a new American Standard for the machine. Now, the standard specifies the design, construction, and operation of the machine so that comparable tests and results can be obtained by all agencies using the device.

The standard enables authorities to drop equipment ranging in weight from 150 to 400 pounds and test for shock. A sandpit cushions the equipment after it has fallen anywhere from 4 to 13 inches.

American Standard Specification for the Design, Construction, and Operation of Variable-Duration, Medium-Impact Shock-Testing Machine for Lightweight Equipment, S2.1-1961, is available from ASA at $1.00 per copy.

Colonel Willard T. Chevalier, McGraw-Hill Publishing Company executive for the past 27 years, died June 29 at 75 years of age. Colonel Chevalier had served as a member of the Board of Directors of the American Standards Association from 1952 through 1957. Of this service, ASA executives comment: "The breadth of his experience in engineering, industrial, and economic affairs and his sympathetic understanding of the principles underlying the functions of ASA gave a value to his advice and counsel that was outstanding. His service will always remain as one of the brightest pages in the history of this organization."

American Standard Guide for Selecting Greek Letters Used as Letter Symbols for Engineering Mathematics

by Harold P. Westman
Editor, Electrical Communications

IT MAY SEEM rather strange for ASA to be approving a standard for the Greek alphabet, for certainly the Greeks must have this matter well in hand after the many centuries in which they have been using their language.

Actually, this new American Standard does not in the least influence the Greek alphabet. Rather, it is simply a selection of those Greek characters that are clearly different from all other Greek and Latin letters to make them useful as letter symbols for engineering mathematics. As context cannot be relied on to identify characters in mathematics, each character must be clearly identifiable when standing alone.

The standard recognizes 11 capital and 23 small Greek letters that fulfill the requirements for unique identification. Certain aids are given in an appendix to help the author, editor, and printer in specifying these characters, as difficulties are evident in cases where alternative forms of a letter are not normally distinguished by different names.

Copies of American Standard Guide for Selecting Greek Letters Used as Letter Symbols for Engineering Mathematics, Y10.17-1961, are now available from ASA at $1.00.

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THE AMERICAN SOCIETY of Safety Engineers, one of the most active cooperating organizations in the development of safety standards, is observing its fiftieth anniversary October 8, 1961. The Society is the oldest national safety organization in the United States. Founded as the United Association of Casualty Inspectors in 1911 by a number of insurance company inspectors in New York City, the Society changed its name to the American Society of Safety Engineers in 1914. The following year it was chartered by the State of New York. In 1924, the Society merged with the National Safety Council and became known as the Council's Engineering Section. However, in 1947 it was reestablished as an independent organization but maintained affiliation with the Council. In 1959, the Society opened its own headquarters.

The Society now has some 7,000 members in the United States, Canada, and many countries throughout the free world, and has 76 chapters in the USA.

In carrying out its purpose to work for "the prevention of accidents, and conservation of health, life, and property by the control of environmental exposures and human behavior," the Society has been working since the early 1920's on committees developing American Standards in the safety field, first in affiliation with the National Safety Council, and since 1947 in its own right. At present, the Society is working on 58 of these safety standards committees and is a sponsor of three—on ladders, ladder towers and rolling scaffolds, and compressor systems. It is also a member of the ASA Safety Standards Board and Nuclear Standards Board.

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THE PRESIDENT'S Conference on Occupational Safety for 1962 is scheduled to be held in Washington, D.C., March 6-8. General chairman of the Conference will be Secretary of Labor Arthur J. Goldberg, and the executive director will be Reed O. Hunt, president of Crown Zellerback Corporation, San Francisco. Mr Hunt was executive director in 1960.

The first conference was called in 1948 by the then President, Harry S. Truman. Succeeding conferences have been held every two years.

Cyril Ainsworth, deputy managing director of the American Standards Association, is serving as a member of the Technical Advisory Committee.

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TEN WORKING GROUPS were set up at the first meeting of the new international committee (ISO/TC 95) on office machines, held at Turin, Italy, June 22-24. The United States is to hold the secretariat for two of these—(1) typewriters; (2) accounting, bookkeeping, and billing machines and cash registers.

Eight delegates represented the American Standards Association at the meeting, with Carl P. Ray as head of the delegation. Mr Ray is vice-president of marketing for the Royal-McBee Corporation.

Sixty-one delegates from 11 nations attended the meeting:—Denmark, France, Germany, Italy, Netherlands, Poland, Spain, Switzerland, Sweden, United Kingdom, and the United States.

The scope of the committee's work, as unanimously approved by the delegates, will be: "Standardization of terminology and definitions of functions of office machines and other fundamental elements of interest to users and manufacturers of such machines."

The ten working groups which have been given the task of starting work on the project are:

Working Group	*Secretariat*
A Typewriters	USA
B Adding and Calculating Machines (without mobile paper carriages or alphabetic device)	Italy
C Accounting, Bookkeeping, and Billing Machines and Cash Registers	USA
D Duplicating and Reproducing Machines	UK
E Dictating Machines	UK
F Addressing, Mailing, and Other Special Machines	Germany
G Terminology	Switzerland
H Input-Output Equipment	Italy
I Basic Paper Layouts	Sweden
X Coordinating Group	Staff of Secretariats

The groups will survey the work done nationally and internationally in the field assigned to them; prepare a list of items to be made the subject of ISO projects; prepare an outline in broad terms of the scope of each project; make recommendations as to how the work may be handled most expeditiously.

It is planned that the entire ISO/TC 95 will meet again in October 1962 at Paris, France, to act on reports submitted by the working group.

In the United States, the work will be centered in Sectional Committee X4, Office Machines, sponsored by the Business Equipment Manufacturers Institute.

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FARMERS, road builders, railroads, and other users of creosoted wood fence posts can now be assured of getting properly treated posts by looking for the grade mark symbol of a newly established Commercial Standard, CS 235-61, on each post, according to the Commodity Standards Division, Office of Technical Service, U.S. Department of Commerce.

Printed copies of this new standard, Pressure-Treated Wood Fence Posts

(with Oil-Type Preservatives), are now available from the Government Printing Office, Washington 25, D. C., for 15 cents each.

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THE INDIAN STANDARDS Institution announces its Sixth Indian Standards Convention, to be held at Kanpur from December 25 to 31, 1961. Subjects to be taken up at the technical sessions will include (1) Productivity in building design and construction; (2) Review of Indian experience with certification marking; (3) Packaging; (4) Company standardization practices; (5) Introduction of the metric system in engineering industries; (6) Adoption of the universal count system in textiles; (7) Housing and preservation of documents; (8) Safe use of electricity in the home; (9) Nondestructive testing of metals. In addition to the technical sessions, visits to industrial concerns are being arranged.

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TIME-HONORED procedures cannot provide the ultra-precise gaging which will permit mass production with interchangeability of parts so essential in modern industry, industry representatives told the National Bureau of Standards recently. They urged the Bureau to undertake a research effort to develop standards and measuring techniques based on entirely new concepts.

Are These Cases Work Injuries?

This is the forty-second installment in the current series of rulings as to whether unusual industrial injury cases are to be counted as "work injuries" under the provisions of American Standard Method of Recording and Measuring Work Injury Experience, Z16.1-1954 (Reaffirmed 1959). The numbers in parentheses refer to those paragraphs in the standard to which the cases most closely apply. Decisions on unusual industrial injury cases are issued periodically by the Z16 Committee on Interpretations. Reprints of each double page of cases published in THE MAGAZINE OF STANDARDS can be obtained in quantity from the American Standards Association at $1.50 per 50 copies.

Sectional Committee Z16 is sponsored by the National Safety Council and the Accident Prevention Department of the Association of Casualty and Surety Companies.

INDEX TO CASES 400-800. An index to Cases 400-800 has now been completed. Arranged numerically by the number of the applicable paragraph of American Standard Z16.1-1954 (R1959), the index includes the number of the case indexed and a key letter indicating what the decision was in each case. Each index reference includes a brief description of the case.

Reprints of Cases 400-800, with the index, are now available from ASA at $2.50. Discounts for quantity orders may be obtained on request.

CASE 865 (5.1)

On Friday, an employee was laid off in accordance with the seniority regulations of an agreement, along with a group of other employees, for an indefinite period of time. On the following Monday, he visited the company doctor. He claimed to be suffering from a hernia which he had noticed for the first time on his last shift on Friday. Upon examination, the doctor found a small inguinal hernia. There was no history of an accident at this time and the employee had made no mention of this suspected disability to his own supervisor prior to being laid off.

Decision: This injury should not be included in the rates as the statements submitted showed clearly that this hernia did not meet the requirements of paragraph 5.1.

CASE 866 (1.2.4)

On March 7, a female editor slipped and injured her back while running across the parking apron at the airport. The parking ramp was damp from snow which had been cleared away. The time of injury was before normal working hours, but the employee was boarding the plane in the line of business. Traveling was a regular part of her duties. She continued normal duties until April 22 when her back pain became so severe she was forced to remain in bed. However, she continued to perform normal editorial duties at home.

Decision: This injury should be considered a disabling injury and should be included in the rates in accordance with the ultimate extent of disability. The committee commented that, while this employee continued to perform some of her normal duties at home, she could not do all phases of her work, such as traveling, and therefore this case should be considered a temporary total disability during the time the employee was at home.

CASE 867 (5.12)

A technician, while walking to another building, delivering samples for analysis, sustained a wind-blown foreign body in his right eye. He reported the incident to his supervisor and was sent to the nurse on duty. After examining the eye and consulting with the company doctor by telephone, the nurse sent the employee to an outside physician. After medication was applied along with a pad and patch, the employee returned to work. An hour later, the employee claimed his other eye felt strained and he was sent home by his supervisor because he could not satisfactorily perform his work assignment. As a result of this injury, he lost 3 days from work. Because the foreign body had been raised by the wind in a normally clean area, a question was raised if this could be excluded from the records on the basis of paragraph 5.12.

Decision: This injury should be included in the rates in accordance with the ultimate extent of disability. The committee commented that as the wind was not of hurricane or tornado force, but was a light local wind, paragraph 5.12 does not apply in this case.

CASE 868 (A1.6a)

An employee, because of infrequent bus service from his home to his place of work, was permitted to enter company property an hour prior to his starting time as a convenience to him. Upon his arrival at the gate on the day of the accident, he stopped in a checkpoint shack to pick up a key for the office building. This key was kept in the shack for the watchman's use during the night. This was a regular daily procedure and allowed by his employer.

During this time, a company truck and chauffeur on night emergency stand-by status was parked beside the checkpoint shack with its front end jutting about 3 ft onto an infrequently used spur track passing within 8 ft to 10 ft of the shack. At the same time, a diesel locomotive pushing a gondola car loaded with scrap was on the spur approaching the shack from the side where the truck was parked. The engine was traveling about 3 miles an hour when the parked truck was noted. The truck driver, noting the approach of the train, attempted unsuccessfully to start the truck and move it out of the way. When the brakeman saw that the truck was not moving, he signalled for an emergency stop, but due to the fact that the rails were wet and rusty and overgrown with grass and that the weight of the gondola car was dragging the braking engine, the engine was dragged about 100 ft up to the roadway where the shack was located. The left front section of the gondola car struck the right front of the parked car and knocked it leftward against the shack, which was thrown from its concrete foundation.

The employee was squatting in the doorway of the shack and as a result of the accident got pinned between the truck and the building and received a double fracture in his left leg.

Decision: This injury should be included in the rates in accordance with the ultimate extent of disability. The committee commented that the employee was on the premises in connection with his work and that the accident resulted from a hazard of employment.

CASE 869

No decision. Question not covered by the standard.

CASE 870 (5.18)

On Monday, an employee was walking through the station yard when he stepped on a small clod and turned his ankle. He reported the incident to his supervisor, but did not think he needed medical treatment. However, during the evening the ankle was paining him so he went to a local clinic, where the doctor prescribed treatment. As the employee was not scheduled to return to work until Thursday afternoon, the doctor asked him to report back on Thursday morning for a check-up. When the employee reported back to the clinic, the doctor who had treated his ankle was not available and the attending doctor refused to sign the patient's release because he was not familiar with the case. The employee was walking on the foot without pain at this time. On Saturday morning, the original doctor was available and signed the employee's release.

The employee stated that he could have worked on Tuesday and Wednesday had he been scheduled to work. Also the doctor who treated him on Monday night stated that it was a minor sprain and there was no reason for him to lose time from work with this sprain.

Decision: This injury should not be included in the rates. The committee commented that this decision was based upon the statement of the doctor that this was only a minor injury and that there was no reason for this employee to lose time from work.

CASE 871 (5.4)

On March 21, a conveyor of process material rolled over the right hand of an employee. The injury to the middle finger was so slight that no discoloration resulted and the employee did not request medical attention until 3 days later when the finger became white and painful due to lack of circulation which was diagnosed as "Reynaud's Phenomenon." The employee lost no time from work until June 6, when he was hospitalized for a sympathectomy. The doctor stated that there was no immediate hazard about the loss of the finger, but felt that if the employee were to injure it again he might sustain loss of the finger itself. The doctor further stated that a sympathectomy would provide significant protection against such an incident.

Decision: This injury should be included in the rates. The committee commented that the employee had an industrial accident which aggravated a pre-existing physical deficiency that caused disability.

CASE 872 (1.2.4)

A Fire Department was operating on the two-platoon system, 24 hours on duty and 24 hours off duty. The tour of duty was from 8:00 A.M. to 8:00 A.M., thus the firemen performed 16 hours of labor on one calendar day and 8 hours the next. A fireman of Division "A" reported on duty at 8:00 A.M., May 5. At 10:00 P.M. that same day he was overcome by smoke at a fire and was unable to continue working until 8:00 A.M. on May 6, when his division was relieved by Division "B". Division "A" was scheduled to return to work at 8:00 A.M. on May 7. The employee did return to work at that time. The definition of Temporary Total Disability, paragraph 1.2.3, is stated in terms of shifts, while paragraph 1.8.1, Days of Disability, speaks of calendar days. Since this employee was actually injured on May 5 and did not return to work until 8:00 A.M. May 7, the question was raised as to whether this should be considered a medical treatment case or a temporary total disability.

Decision: This should be considered a medical treatment case and not a temporary total disability. The committee commented that this was quite similar to Case 439. This employee was injured on the 24-hour duty period beginning on May 5 and he returned to work on his next regular duty period beginning on May 7. The committee decided that the period from 8:00 A.M. to 8:00 A.M. the following day would be recognized as one calendar day.

CASE 873 (1.6)

A staff physician suffered a heart attack while on duty after having an argument with a difficult patient. The physician had had a physical examination approximately a month before and no evidence of heart disease had been found. On two previous occasions he had suffered from epigastric pain of short duration, but this had not inconvenienced nor deterred him from carrying out his duties. He had never received treatment for cardiac disease. The doctor who treated the staff physician stated that he believed that the heart attack had been precipitated by the verbal altercation with the difficult patient.

Decision: This should be considered an industrial injury. This decision was based on the attending physician's opinion that the argument with the patient contributed to bringing on the heart attack.

CASE 874 (1.2.3)

In 1943, an employee lost 100 percent of the vision in his right eye, due to a foreign body. In 1960, he received a chemical burn from caustic soda which caused severe burns of the right eye, and finally the right eye had to be enucleated. A question was raised as to whether or not a time charge of 1,800 days should be assessed for the loss of the eye or whether the charges should be the actual lost time.

Decision: This should be considered a permanent partial disability with a time charge of 1,800 days. The committee called attention to paragraph 1.2.3 of the standard, which states that permanent partial disability is any injury, other than death or permanent total disability, which results in the complete loss, or loss of use, of any member or part of a member of the body, or any permanent impairment of functions of the body or part thereof, regardless of any pre-existing disability of the injured member or impaired body function. The committee also commented that the fact that the standard does not permit taking credit for previous disability when evaluating a new injury is balanced by the fact that in paragraph 1.2.2 the effect of a new injury should not be added to a previous disability to produce a permanent total evaluation. Each occurrence must be considered and evaluated independently of all past occurrences.

STANDARDS FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Information about those standards not selected for listing in THE MAGAZINE OF STANDARDS may also be obtained from the ASA Library. Orders for these standards may be sent to the country of origin through the ASA office. Titles are given here in English, but, except where otherwise indicated, documents are in the language of the country from which they were received. For the convenience of readers, the standards are listed under their general Universal Decimal Classification number. In ordering copies, please refer to the number following the title of the standard.

669 METALLURGY

Argentina (IRAM)

Determination of austenite grain in steel IRAM 122
Microscopic test of ferrous metals IRAM 120

Austria (ONORM)

Steel. General technical delivery requirements ONORM M 3101

Belgium (IBN)

Content of tin in steel and cast iron. Titration method NBN 561
Content of chrome in steel and cast iron. Titration method NBN 562
Content of tungsten in steel and cast iron. Gravimetric method NBN 565

Czechoslovakia (CSN)

Zinc grade 99.96 CSN 42 3447
Zinc grade 98.6 CSN 42 3452
Zinc alloy Zn-Pb-Cd CSN 42 3470
Zinc plates and strips CSN 42 8334
Zinc alloy plates for polygraphical use CSN 42 8335
Zinc alloy plates for offset printing CSN 42 8336
2 stds for zinc bands, assortment CSN 42 8337/8
Round zinc wire CSN 42 8440

France (AFNOR)

Colorimetric method of determination of cobalt contents in steel and cast iron NF A 06-311
Steel beams and shapes, commercial quality, informative survey FD A 35-201
Steel sheets, medium and heavy, and steel plates FD A 35-503
Determination of aluminum and sulfur content in type metal NF A 06-608
Chemical analysis of magnesium and its alloys NF A 06-596

Germany (DNA)

Casting brass and brass alloys DIN 1709 Sht. 2*
Pure aluminum and its alloys DIN 1712 Sht. 4*
Casting aluminum bronze DIN 1714 Sht. 2*
Lead DIN 1719*
Aluminum alloys for different methods of casting DIN 1725 Sht. 2*
High-quality zinc alloy for different castings DIN 1743*
Wrought-aluminum alloy sheets and strips DIN 1745*
DIN 1746*
Wrought-aluminum alloy tubes DIN 1748*
Wrought-aluminum alloy forgings DIN 1749*
Copper alloy bands and strips for springs DIN 1780*
Pure-aluminum tubes, bars, sections DIN 1789/90*
Highest grade aluminum and wrought-aluminum alloy rolled sheets and strips DIN 17605*
German silver DIN 17663*
Wrought copper-nickel alloy DIN 17664*
Bearing alloys based on lead and tin DIN 1703*
Magnesium alloys; wrought alloys DIN 1727 Sht. 1*
Magnesium alloys; cast alloys, sand castings, permanent mould castings, die castings DIN 1727 Sht. 2*
Bars, rods, and wire in wrought aluminum alloys, strength properties DIN 1747*
Magnesium wrought alloy semi-products; mechanical properties DIN 9715*
Tubes, bars, wire sections, die-pressed parts and forgings of highest grade aluminum and highest grade aluminum wrought alloys DIN 17606*
Copper wrought alloys; special brass; composition DIN 17661*
Wrought copper alloys; brass sheet and strip DIN 17670*
Testing of non-ferrous metals; tensile test on butt welds produced by fusion welding DIN 50123*

* Available in English

India (ISI)

Iron powder (reduction grade) IS:1612-1960
Tensile testing of steel products other than sheet, strip, wire, and tube IS:1608-1960
2 stds for different types of testing of steel wire IS:1716/7-1960
Simple bend testing of steel sheet and strip less than 3 mm thick IS:1692-1960
Tensile testing of steel wire IS:1521-1960
Hard-drawn steel wire fabric for concrete reinforcement IS:1566-1960
Tensile testing of steel sheet and strip of thickness 0.5 to 3 mm IS:1663-1960
Mild steel wire for the manufacture of machine screws (by cold-heading process) IS:1673-1960

* Available in English

Italy (UNI)

8 stds for aluminum and aluminum alloys, different chemical composition UNI 4507/4514
3 stds for antifriction metals, different composition UNI 4515/7

New Zealand (NZSI)

Specifications for galvanized sheets (plain and corrugated) NZS 1343:1960

Spain (IRATRA)

Determination of Brinell hardness of structural steels UNE 7017
Copper round wires, stranded UNE 37 110
Copper ribbons, sharp-edged UNE 37 118
Copper tubes, drawn UNE 37 119
Copper bars, square cross section, sharp edges, standard sizes UNE 37 120
4 stds for hot rolled aluminum and aluminum alloy shapes UNE 38 049,-053/4,-059
Aluminum and aluminum alloy I-beams, hot-rolled UNE 38 056
Aluminum and aluminum alloy Z-shapes, hot-rolled UNE 38 060
3 stds for three grades magnesium-aluminum alloys for moldings UNE 38 511/3
Color code for steel marking UNE 36 008
2 stds for angle- and tee-shapes for welded structures UNE 36 538/9
Steel wire for screws, rivets and similar products UNE 36 546
Steel bands and flanges for tube manufacturing UNE 36 556
Octagonal steel bars, special quality UNE 36 620
2 stds for tool steel UNE 36 070/1

Switzerland (SNV)

Wrought aluminum-magnesium alloys, chemical and physical characteristics VSM 10849
Round copper bar, precision-drawn VSM 11828

United Kingdom (BSI)

Methods for the sampling and analysis of tin and tin alloys
Sampling of ingot tin BS 3338:Part 1:1961
Tin in ingot tin (aluminum reduction method) BS 3338:Part 2:1961
Antimony in ingot tin BS 3338:Part 3:1961
Copper in ingot tin and tin-lead solders BS 3338:Part 4:1961
Lead in ingot tin and tin-antimony solders BS 3338:Part 5:1961

Copper in high-purity ingot tin BS 3338:Part 6:1961
Silver in solders BS 3338:Part 7:1961
Bismuth BS 3338:Part 8:1961
Tin in solders (nickel coil reduction method) BS 3338:Part 11:1961
Sampling of solders BS 3338:Part 12:1961
Iron castings with spheroidal or nodular graphite BS 2789:1961
Pearlitic malleable iron castings BS 3333:1961
Galvanized coating on wire BS 443:1961
Wire for automatic twisting balers BS 3335:1961

744 TECHNICAL DRAWINGS

Belgium (IBN)

Drawings. Views NBN 516
Drawings. Cuttings and sections NBN 517
Drawings. Dimensioning NBN 518

Germany (DNA)

Axonometric projections DIN 5*
Views, sections, special methods of representation DIN 6*
2 stds for lines DIN 15 Shts. 1, 2*
2 stds for lettering; two styles DIN 16, 17*
Simplification of small-scale representation DIN 30*
3 stds for surface symbols on drawings, three methods DIN 140 Shts. 4, 5, 6*
Drawings for printing purposes DIN 474*
Lettering styles, grotesque DIN 1451*
Lettering standard handwriting DIN 1455*
Representation of optical components on drawings DIN 3140*
4 stds for title block, parts list, grid references DIN 6771 Shts. 1, 2, 6781/2*
Drawing practice; dimensioning DIN 406*
Surface symbols in drawings; assignment of peak-to-valley heights DIN 3141*
Identification of surfaces in drawings by means of roughness grades DIN 3142*

Netherlands (NNI)

2 stds for technical drawings. Hatching and sectioning NEN 2392/3

Switzerland (SNV)

Letter symbols indicating machining and surface finish VSM 10320

77 PHOTOGRAPHY AND CINEMATOGRAPHY

United Kingdom (BSI)

Photographic grade sodium tetraborate (borax) BS 3311:1961
Photographic grade aluminum potassium sulphate (potash alum) BS 3312:1961
Studio spotlight lamps BS 1075:1961

USSR

8-mm and 16-mm motion picture cameras. Spools GOST 9615-61

* Available in English

New Books . . .

STANDARDIZATION. LITERATURE RECOMMENDATIONS. *May 1959. 76 pp. Heavy paper cover. Office of Industrial Resources, International Cooperation Administration, Washington 25, D.C.*

A bibliography of literature on standardization, this booklet is designed to give a comprehensive view of U.S. activities in standardization during the years 1946 through 1956. Some cooperative efforts on an international basis are also cited. Many examples of specific industry and product studies are noted. The bibliography was prepared by the John Crerar Library, Chicago, under contract to the Office of Technical Services, U.S. Department of Commerce.

UNITS OF WEIGHTS AND MEASURES (UNITED STATES CUSTOMARY AND METRIC)— DEFINITIONS AND TABLES OF EQUIVALENTS. *National Bureau of Standards Miscellaneous Publication 233 (supersedes Miscellaneous Publication 214). December 1960. 20 pp. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. $0.40.*

An agreement reached in 1959 among the directors of national standards laboratories of English-speaking nations to obtain uniformity in precise measurements involving the yard and the pound has brought about refinements in the definition of the U.S. customary units of length and mass, and has made a revised edition of this publication desirable.

The units of length, area, volume, capacity, and mass in the United States are defined in conformity with the 1959 agreement, and the tables of interrelation and tables of equivalents for these units in the metric system and in the U.S. customary system have been recalculated by automatic computer.

Further revisions include the deletion of the table showing interrelation between bushels and hectoliters, and the addition of a more complete table showing equivalents of inches in millimeters.

ENGINEERING DRAWING AND GEOMETRY. *By Randolph P. Hoelscher and Clifford H. Springer. Second edition. 1961. John Wiley & Sons, Inc, 440 Park Ave South, New York, N.Y. $8.95.*

Two prominent members of the Sectional Committee on Drawings and Drafting Practice, Y14, are authors of this authoritative textbook on engineering drawing. Designed for engineers, the book emphasizes principles rather than manual skills. Third quadrant projection, the basis for unification of drawing practices among the United States, United Kingdom, and Canada, is followed, not only for principal views but for auxiliary views as well. Part 1 of the book presents basic drawing; Part 2, the geometry of advanced projection systems; Part 3, technical charts and graphic computation; and Part 4, professional applications, such as map drawing, architectural drawing, and others.

NEW INTERNATIONAL RECOMMENDATIONS

ISO Recommendations are published by the International Organization for Standardization, and IEC Publications by the International Electrotechnical Commission, Geneva, Switzerland. Copies are available from ASA.

FIELD AND LABORATORY MEASUREMENTS OF AIRBORNE AND IMPACT SOUND TRANSMISSION. ISO R 140. January 1960. First edition. $1.80.

Defines methods of measuring the airborne sound insulation of walls and the airborne and impact sound insulation of floors, both in the field and in the laboratory.

Various workers in the field of research on sound insulation in buildings have for some years used similar methods for the measurement of sound transmission, but these methods have differed sufficiently to make direct comparisons of the results difficult if not impossible. The purpose of this ISO Recommendation is to define methods for the measurement of sound transmission in buildings and for the expression of the results, both for field and laboratory measurements in this sphere, so that data obtained by different workers may be directly compared.

WEFT PIRNS FOR AUTOMATIC LOOMS. ISO R 143. January 1960. First edition. $0.90.

Dimensions in both millimeters and inches are given. This international standard was prepared by ISO Technical Committee 72, Textile Machinery and Accessories. Twenty-one ISO member-bodies, including the USA, approved the standard.

REVERSE BEND TESTING OF STEEL WIRE. ISO R 144. February 1960. First edition. $1.20.

Provides a standard test method for the reverse bend of steel wire having a diameter equal to or greater than 0.5 mm (0.02 in.).

LOAD CALIBRATION OF TESTING MACHINES FOR TENSILE TESTING OF STEEL. ISO R 147. February 1960. First edition. $0.90.

Applies to the load calibration of machines used for tensile testing steel in accordance with ISO R 82, Tensile Testing of Steel. It provides for calibration of the machine under conditions of increasing load, and describes three methods which provide for calibration of the load by means of weights (masses); by means of elastic devices (dynamometers); and by means of proving levers.

BEAM IMPACT TEST V-NOTCH FOR STEEL. ISO R 148. February 1960. First edition. $1.20.

The test consists in breaking by one blow from a swinging hammer, under conditions defined, a test piece V-notched in the middle and supported at each end.

MODIFIED ERICHSEN CUPPING TEST FOR STEEL SHEET AND STRIP. ISO R 149. February 1960. First edition. $1.20.

The test is normally applicable to products having a thickness of not less than 0.5 mm and not more than 2 mm. It may, however, be extended to products having a thickness less than 0.5 mm by agreement between the parties concerned.

CALIBRATION OF BRINELL HARDNESS TESTING MACHINES. ISO R 156. April 1960. First edition. $0.90.

Applies to the calibration of testing machines for determining Brinell hardness in accordance with ISO R 79, Brinell Hardness Test for Steel. If a machine is also intended for other methods of hardness testing, it should be calibrated for each method.

DETERMINATION OF ASH OF HARD COAL. ISO R 158. June 1960. First edition. $0.90.

The standard states the principle governing the application of the method, describes the apparatus to use, the procedure to be followed, the formula for calculating the results, and the acceptable tolerances. The procedure recommended must be strictly followed in order to obtain reproducible results in determining the ash in coal.

DETERMINATION OF TOTAL SULPHUR IN COAL BY THE STRAMBI METHOD. ISO R 159. June 1960. First edition. $1.80.

States the principle under which the test is to be carried out and the range of sulphur for the gravimetric and titrimetric method. The publication describes the apparatus and reagents to be used and the formulas to calculate the results for both methods, including the tolerances for both methods.

AMERICAN STANDARDS

Just Published . . .

If your company is a member of the American Standards Association, it is entitled to receive membership service copies of these newly published American Standards. The ASA contact in your company receives a bimonthly announcement of new American Standards, which also serves as an order form. Find out who your ASA contact is and order your American Standards through him. He will make sure your company receives the service to which it is entitled.

BUILDING AND CONSTRUCTION

Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units, Specifications for, ASTM C 126-60T; ASA A101.1-1961 (Revision of ASTM C 126-59T; ASA A101.1-1960) $0.30

Covers structural clay load-bearing facing tile and facing brick and other solid masonry units made from clay, shale, fire-clay or mixtures thereof, with or without addition of grog or other admixtures, having a finish consisting of ceramic glaze, excluding natural salt-glazed ware.

Sponsor: American Society for Testing Materials

Asphalt-Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs, Specifications for, ASTM D 226-60; ASA A109.2-1961 (Revision of ASTM D 226-56; ASA A 109.2-1956) $0.30

Asphalt-saturated felts, either with or without perforations, 36 or 32 in. in width, composed of roofing felt saturated with asphalt for use in membrane system of waterproofing and in construction of built-up roofs.

Woven Cotton Fabrics Saturated with Bituminous Substances for Use in Waterproofing, Specifications for, ASTM D 173-60; ASA A109.12-1961 (Revision of ASTM D 173-44; ASA A109.12-1955) $0.30

Covers bituminous cotton fabric composed of woven cotton cloth waterproofed with either asphalt or coal-tar pitch, as specified by the purchaser, for use in membrane system of waterproofing.

Sponsor: American Society for Testing Materials

Refractory Materials, Methods of Chemical Analysis, ASTM C 18-60; ASA A111.2-1961 (Revision of ASTM C 18-52; ASA A111.2-1955) $0.50

Procedures for chemical analysis of fireclay, silica, high-alumina, magnesite, and dolomite refractories, and of chrome ore and chrome refractories. Methods apply to products as sold commercially.

Sponsor: American Society for Testing Materials

ELECTRIC AND ELECTRONIC

Fuseholders, Safety Standard for, UL 512; ASA C33.10-1961 $0.75

These safety requirements cover: (1) *Fuseholders for 125-volt Edison-base and Type "S" plug fuses with 30-ampere or lower continuous-current ratings; (2) fuseholders for 250- and 600-volt cartridge fuses with 600-ampere or lower continuous-current ratings; and (3) devices to adapt Type "S" plug fuses for use in the Edison-base type of plug fuseholder.*

Sponsor: Underwriters' Laboratories, Inc

Outlet Receptacles, Attachment Plug Caps and Appliance Plugs, C73.1-1961 (Revision of C73.1-1957 and supplement C73.1a-1959) $1.50

Configurations and dimensions necessary to provide for interchangeability and to promote proper use of subject apparatus in accordance with the American Standard National Electrical Code, C1.

Sponsor: National Electrical Manufactures Association

MECHANICAL

Bearing Mounting for Ball and Roller Bearings, Specifications for, B3.8-1960 (Revision of B3.8-1951) $2.30

This standard establishes the features of the housing and the shaft that affect the proper fit of a bearing into its designed location.

Sponsor: Anti-Friction Bearing Manufacturers Association

Shapes and Sizes of Diamond Grinding Wheels, Hand Hones, and Mounted Wheels, B74.3-1961 $1.50

Establishes a listing of sizes for each standard shape of diamond grinding wheels, hand hones, and mounted wheels, which are based on sound engineering and industry demand.

Sponsor: Grinding Wheel Institute

Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines, Specifications for, ASTM B 16-60; ASA H8.1-1961 (Revision of ASTM B 16-58; ASA H8.1-1959) $0.50

Covers free-cutting brass rod, bar, and shapes of any specified cross-section, suitable for high-speed screw machine work. Includes general requirements, chemical composition, tensile properties, test specimens, dimensions, and tolerances.

Sponsor: American Society for Testing Materials

METALLURGY

High-Strength Steel Castings for Structural Purposes, Specifications for, ASTM A 148-60; ASA G52.1-1961 (Revision of ASTM A 148-58; ASA G52.1-1959) $0.30

Specifications for carbon-steel and al-

loy-steel castings that are to be subjected to higher mechanical stresses than those covered in American Standard G50.1.

Sponsor: American Society for Testing Materials

Electrodeposited Coatings of Lead on Steel, Specifications for, ASTM B 200-60; ASA G53.8-1961 (Revision of ASTM B 200-55T; ASA G53.8-1956) $0.30

Requirements for electroplated lead coatings on steel articles that are required to withstand atmospheric corrosion.

Sponsor: American Society for Testing Materials

PHOTOGRAPHY

Photographic Grade 1-Phenyl-3-Pyrazolidone, Specification for, PH4.136-1960 $0.50

Photographic Grade Ammonium Chloride, Specification for, PH4.183-1961 (Revision of PH4.183-1953) $0.40

Photographic Grade Sodium Bisulfite, Anhydrous (Sodium Metabisulfite), Specification for, PH4.276-1960 (Revision of PH4.276-1958) $0.50

Physical and chemical properties, purity requirements, and test methods to ensure satisfactory use of photographic processing chemicals.

Sponsor: Photographic Standards Board

PIPE AND FITTINGS

Clay Pipe, Methods of Testing, ASTM C 301-60T; ASA A106.5-1961 (Revision of ASTM C 301-55; ASA A106.5-1955) $0.30

Procedures for testing clay pipe for crushing strength, absorption, and resistance to acid.

Sponsor: American Society for Testing Materials

PLASTICS

Rockwell Hardness of Plastics and Electrical Insulating Materials, Method of Test for, ASTM D 785-60T; ASA K65.3-1961 (Revision of ASTM D 785-51; ASA K65.3-1959) $0.30

Procedures for testing indentation hardness of plastics and related plastic electrical insulating materials by means of Rockwell hardness tester.

Specific Gravity of Plastics, Methods of Test for, ASTM D 792-60T; ASA K65.3-1961 (Revision of ASTM D 792-50; ASA K65.8-1959) $0.30

Test methods covering determination of specific gravity and density of solid plastics; for plastics in finished condition, and for plastics in forms such as molding powder, pellets, flake, or the like.

Sponsor: American Society for Testing Materials

TEXTILES

Resistance of Textiles to Mildew and Rot, and Evaluation of Textile Fungicides, AATCC 30-1957; ASA L14.55-1960 (Revision of L14.55-1951) $0.50

Colorfastness to Peroxide Bleaching, AATCC 29-1957; ASA L14.58-1960 (Revision of L14.58-1956) $0.40

Sponsors: American Association of Textile Chemists and Colorists; American Society for Testing Materials

In Process . . .

As of August 10, 1961

BUILDING AND CONSTRUCTION

In Standards Board

Chemical Analysis of Portland Cement, Method of, Part I, ASTM C 114-58; ASA A1.5- (Revision of ASTM C 114-53; ASA A1.5-1954)

Fineness of Portland Cement, Method of Test by Turbidimeter, ASTM C 115-58; ASA A1.7- (Revision of ASTM C 115-53; ASA A1.7-1954)

Air Content of Hydraulic Cement Mortar, Method of Test for, ASTM C 185-59; ASA A1.9- (Revision of ASTM C 185-53T; ASA A1.9-1954)

Heat of Hydration of Portland Cement, Method of Test, ASTM C 186-55; ASA A1.10- (Revision of ASTM C 186-53; ASA A1.10-1954)

Normal Consistency of Hydraulic Cement, Method of Test, ASTM C 187-58; ASA A1.11- (Revision of ASTM C 187-49; ASA A1.11-1950)

Tensile Strength of Hydraulic Cement Mortars, Method of Test, ASTM C 190-59; ASA A1.14- (Revision of ASTM C 190-49; ASA A1.14-1950)

Time of Setting of Hydraulic Cement, Method of Test by Vicat Needle, ASTM C 191-58; ASA A1.15- (Revision of ASTM C 191-52; ASA A1.15-1954)

Time of Setting of Hydraulic Cement, Method of Test by Gillmore Needle, ASTM C 266-58T; ASA A1.17- (Revision of ASTM C 266-51T; ASA A1.17-1954)

Natural Cement, Specification for, ASTM C 10-54; AASHO M 135-49; Federal SS-C-185; ASA A1.18-

Fineness of Portland Cement, Method of Test by Air-Permeability Apparatus, ASTM C 204-55; AASHO T 153-52; Federal 158; ASA A1.19-

Flow Table for Use in Tests of Hydraulic Cement, Specification for, ASTM C 230-57T; ASA A1.20-

Slag Cement, Specification for, ASTM C 358-58; ASA A1.21-

Cement Content of Hardened Portland Cement Concrete, Method of Test, ASTM C 85-54; ASA A1.22-

Mechanical Mixing of Hydraulic Cement Mortars of Plastic Consistency, Method of, ASTM C 305-59T; ASA A1.23-

Air-Entraining Additions for Use in the Manufacture of Air-Entraining Portland Cement, Specification for, ASTM C 226-58T; ASA A1.24-

Portland-Pozzolan Cement, Specification for, ASTM C 340-58T; ASA A1.25-

Sponsor: American Society for Testing Materials

Interior Marble, Specifications for, A94.1- (Revision of A94.1-1948)

Thin Exterior Marble Veneer (Two Inches and Less in Thickness), Specifications for, A94.2- (Revision of A94.2-1955)

Thin Exterior Marble in Curtain or Panel Walls, Specifications for, A94.3- (Revision of A94.3-1955)

Sponsor: Marble Institute of America

Reaffirmation Being Considered

Specific Gravity of Hydraulic Cement, Method of Test, ASTM C 188-44; ASA A1.12-1948

Sponsor: American Society for Testing Materials

CHEMICAL

In Board of Review

Common Name for the Pest Control Chemical 3-amino-*s*-triazole (or 3-amino-1,2,4-triazole): amitrole, K62.24-

Sponsor: U. S. Department of Agriculture

In Standards Board

Common Name for the Pest Control Chemical 2-chloro-4-ethylamino-6-isopropylamino-*s*-triazine: atrazine, K62.26-

Common Name for the Pest Control Chemical 2-chloro-4, 6-bis (diethylamino)-*s*-triazine: chlorazine, K62.27-

Sponsor: U. S. Department of Agriculture

DRAWINGS, SYMBOLS AND ABBREVIATIONS

In Standards Board

American Standard Drafting Manual, Section 14, Mechanical Assemblies, Y14.14-

Sponsors: American Society of Mechanical Engineers; American Society for Engineering Education

Graphic Symbols for Process Flow Diagrams in the Petroleum and Chemical Industries, Y32.11-

Sponsors: American Society of Mechanical Engineers; American Institute of Electrical Engineers

ELECTRIC AND ELECTRONIC

American Standards Approved

Monochrome Television Broadcast Receivers, Methods of Testing, C16.13-1961 (Revision of 48 IRE 22.S1; C16.13-1949)

Sponsor: Institute of Radio Engineers

40-Watt T-12 Preheat-Start Fluorescent Lamp, C78.408-1961 (Revision of C78.408-1956)

40-Watt T-12 Rapid-Start Fluorescent Lamp, C78.700-1961 (Revision of C78.700-1958)

72-Inch (800- and 1000-Milliampere) T-12 Rapid-Start Fluorescent Lamp, C78.701-1961 (Revision of C78.701-1959)

96-Inch (800-Milliampere) T-12 Rapid-Start Fluorescent Lamp, C78.702-1961 (Revision of C78.702-1959)

48-Inch (800- and 1000-Milliampere)

T-12 Rapid-Start Fluorescent Lamp, C78.704-1961

48-Inch (1.5 Ampere) T-12 and PG-17 Rapid-Start Fluorescent Lamp, C78.705-1961

72-Inch (1.5 Ampere) T-12 and PG-17 Rapid-Start Fluorescent Lamp, C78.706-1961

96-Inch (1.5 Ampere) T-12 and PG-17 Rapid-Start Fluorescent Lamp, C78.707-1961 (Revision of C78.707-1959)

Sponsor: Electrical Standards Board

Mercury Lamp Ballasts (Multiple-Supply Type), Specifications for, C82.4-1961

Mercury Lamp Reference Ballasts, Specification for, C82.5-1961

Methods of Measurement of Mercury Lamp Ballasts, C82.6-1961

Series Street Lighting Transformers for Mercury and Incandescent Lamps, Specifications for, C82.7-1961

Sponsor: Electrical Standards Board

In Board of Review

Natural Muscovite Mica Based on Visual Quality, Specifications for, ASTM D 351-60T; ASA C59.27- (Revision of ASTM D 351-57T; ASA C59.27-1957)

Sponsor: American Society for Testing Materials

Glow Lamps, Method for the Designation of, C78.381-

Glow Lamps, Methods of Measurement, C78.385-

Sponsor: Electrical Standards Board

In Standards Board

Supplements to American Standard Requirements, Terminology, and Test Code for Distribution Power and Regulating Transformers and Reactors Other Than Current Limiting Reactors, C57.12-

- General, C57.12.00- (Revision of C57.12.00-1958)
- Terminology, C57.12.80- (Revision of C57.12.80-1958)
- Test Code, C57.12.90- (Revision of C57.12.90-1958)

Sponsor: Electrical Standards Board

MECHANICAL

American Standard Approved

Carbide Blanks for the Manufacture of Positive and Negative Rake Precision Inserts, Throw-Away Type, B80.1a-1961 (Addendum to American Standard B80.1-1959)

Sponsor: Cemented Carbide Producers Association

In Standards Board

Addendum B31.1a- to American Standard Code for Pressure Piping, B31.1-1955 (Revision of B31.1a-1960)

Addendum B31.3a- to American Standard Petroleum Refinery Piping, B31.3-1959 (Revision of B31.3a-1960)

Addendum B31.4a- to American Standard Oil Transportation Piping, B31.4-1959 (Revision of B31.4a-1960)

Addendum B31.8a- to American Standard Gas Transmission and Distribution Piping Systems, B31.8-1958 (Revision of B31.8a-1960)

Sponsor: American Society of Mechanical Engineers

PHOTOGRAPHY

In Board of Review

Picture Sizes for Roll and 35-mm Still-Film Cameras, PH3.39- (Revision of Z38.4.8-1950)

Sponsor: Photographic Standards Board

In Standards Board

Determining the Safety Time of Photographic Darkroom Illumination, Procedure for, PH2.22- (Revision of Z38.8.13-1950)

Lighting Conditions for Viewing Photographic Color Prints and Transparencies, PH2.23-

Sponsor: Photographic Standards Board

Photographic Grade *p*-Benzyl-aminophenol Hydrochloride, Specification for, PH4. 135- (Revision of PH4.135-1954)

Photographic Grade Benzyl Alcohol, Specification for, PH4.181- (Revision of PH4.181-1954)

Sponsor: Photographic Standards Board

Withdrawal Being Considered

Photographic Wetting Agents, Requirements for, Z38.8.14-1950

Sponsor: Photographic Standards Board

PIPE AND FITTINGS

In Board of Review

Steel Pipe Flanges and Flanged Fittings, B16.5- (Revision of B16.5-1957, including Addendum B16.5a-1960)

Sponsors: American Society of Mechanical Engineers; Manufacturers Standardization Society of the Valve and Fittings Industry; Mechanical Contractors Association of America

PLASTICS

In Standards Board

Ethyl Cellulose Molding and Extrusion Compounds, Specification for, K64.1- (Revision of K64.1-1959)

Sponsor: American Society for Testing Materials

SAFETY

In Standards Board

Safety Code for the Identification of Gas-Mask Canisters, K13.1- (Revision of K13.1-1950)

Sponsor: National Safety Council

Prevention of Dust Explosions in Woodworking and Wood Flour Manufacturing Plants, Safety Code for, Z12.20- (Revision of Z12.5-1959 and Z12.8-1959)

Sponsor: National Fire Protection Association

Reaffirmation Being Considered

Safety Code for Woodworking Machinery, O1.1-1954

Sponsors: Association of Casualty and Surety Companies—Accident Prevention Department; International Association of Governmental Labor Officials

AMERICAN STANDARDS PROJECTS

School Lighting, A23—

Sponsors: American Institute of Architects; Illuminating Engineering Society; National Council for Schoolhouse Construction

The officials responsible for planning and building schoolhouses will now have a responsible part in the work of developing standards for school lighting. The National Council for Schoolhouse Construction has joined the American Institute of Architects and the Illuminating Engineering Society as sponsor of the project.

Small Tools and Machine Tool Elements, B5—

Sponsors: American Society of Mechanical Engineers; National Machine Tool Builders' Association; Society of Automotive Engineers; Metal Cutting Tool Institute; American Society of Tool and Manufacturing Engineers

A former vice-chairman of the committee, W. H. Seacord, has now become chairman of B5. Mr Seacord is general supervisor of Manufacturing Standards Research of the International Harvester Company. He has been with IH since 1936. He is a

W. H. Seacord

member of the American Society of Tool and Manufacturing Engineers and the Society of Automotive Engineers.

Mr Seacord was graduated from Cornell University in Mechanical Engineering and received a Master's degree in Business Administration from the University of Chicago in 1959. He has been a member of Sectional Committee B5 since September 1955, and vice-chairman of Group A, Small Tools, since December of that year.

Sectional Committee B5 plans to hold this year's annual meeting in New York on November 30.

Building Code Requirements for Light and Ventilation, A53—

Sponsors: American Public Health Association; American Society of Heating, Refrigerating, and Air-Conditioning Engineers; Illuminating Engineering Society

Plans are going forward to reorganize Sectional Committee A53 and resume work on the project, following recommendations of a four-member steering group of the present committee, which expressed concern over the lack of standardization work in the field. The last American Standard on light and ventilation requirements was approved in 1946.

Tentative plans call for formation of two subcommittees later this year, each to prepare drafts for minimum requirements for daylight and electric light, and specifications for natural and mechanical ventilation and air conditioning. Spokesmen for IES and ASHRAE have indicated that subcommittees would be organized in October to begin standards work. A target date of February 1962 was set for the initial meeting of the reorganized committee, at which time preliminary drafts would be presented.

Steering committee members included Andrew T. Boggs and John G. Eadie of ASHRAE, Francis B. Elder of APHA, and C. L. Crouch of IES.

Classification of Material for Tools, Fixtures, and Gages, B52—

Sponsor: American Society of Tool and Manufacturing Engineers

Jack M. Hockett, assistant head of Manufacturing Engineering Standards of Grumman Aircraft Engineering Corporation, was recently appointed chairman of Committee B52. A Bachelor of Science in Mechanical Engineering from Tufts University and a graduate in Industrial Engineering from Boston University, Mr Hockett is Regional Standards Chairman of the American Society of Tool and Manufacturing Engineers. He is a member of the American Library Association's Committee on Standards for Small Libraries and a trustee and past president of the Levittown Public Library Board. Mr Hockett was elected a National Director of the American Library Trustee Association for 1961-1963.

Commenting on his committee's

Jack M. Hockett

work, Mr Hockett says: "Past achievements of B52 have centered on tool steel. We plan to increase the organizational membership of our committee so that it can classify other very useful tooling materials. Some of the lighter metals, as well as plastics, will be evaluated."

Calibration of Instruments, B88—

Sponsor: American Society of Mechanical Engineers

Official approval has been given by ASA to a new project on calibration of instruments. The scope of the committee's work will be:

"Development of techniques for the calibration of measuring systems for pressure, temperature, fluid flow, and liquid level."

Dimensional Metrology, B89—

Sponsor: American Society of Mechanical Engineers

Work on standards for dimensional metrology has been officially approved as an ASA project. The scope of the sectional committee's work will be: "Calibration and the specific conditions relating thereto. It shall encompass the inspection and the means of measuring the characteristics of the various geometrical configurations, such as lengths, plane surfaces, angles, circles, cylinders, cones, and spheres."

Underground Gasoline Tanks, B90—

Sponsor: American Petroleum Institute

Standards for a major cost item in construction of any service station—underground gasoline tanks—will be the goal of this new project. Standards for capacities, dimensions, gages, weights, and openings of underground tanks are in the scope of the committee's work.

According to Irving H. Passel, API representative at the general conference that recommended the project to ASA, standards would help solve some of the industry's recurring problems by accomplishing the following:

1. Reduce tankage costs by cutting the cost of producing tanks
2. Reduce inventory requirements by keeping the number of tank sizes to a practical minimum, thereby saving warehouse space for the manufacturer and the end user
3. Reduce the time to complete the average service station by avoiding delays in delivering tanks
4. Reduce service station changeover problems by not having to scrap tanks when one company takes over the facilities of another and wants the installation to meet the basic standards of the new operating company.

Identification of Pneumatic Tubing for Control Panel Applications, B91—

Sponsor: Instrument Society of America

Recommended by a general conference held June 28, 1961, this newly approved project will work under the following scope:

"The standardization of systems for the identification of pneumatic tubing used within the confines of instrument control panels."

Delegates at the conference indicated that colors or numbers or a combination of both might be used for identification of metal tubing and also plastic tubing.

Electric Fences, C69—

Sponsor: National Bureau of Standards

It is planned to complete the organization of Committee C69 and to hold a meeting early in the Fall, according to R. L. Lloyd, new chairman

R. L. Lloyd

of C69. Needed information with respect to the possible fire hazard of electric fences and the danger of repeated shocks has been under development and some conclusive results are expected to be available to the

committee in the near future, Mr Lloyd reports.

On the staff of the National Bureau of Standards since 1941, Mr Lloyd is acting chief of the Division of Building Technology of the NBS. He represents the Bureau on many of the safety standards committees under the procedure of the American Standards Association. He is chairman of several, including the National Electrical Safety Code committee, C2; the Panel on Overcurrent Protection of the National Electrical Code, C1; and Raceways for Electrical Wiring Systems, C80. He is secretary of ASA Sectional Committee Z2, Safety Code for the Protection of Heads, Eyes, and Respiratory Organs of Industrial Workers.

A member of numerous technical associations, Mr Lloyd is chairman of the American Institute of Electrical Engineers' Safety Committee which has sponsored many technical sessions on electrical shock, dangerous electrical currents, and improvements in methods of resuscitation. Mr Lloyd has presented a number of papers on the subject of industrial safety.

Computers and Related Equipment, X6—

Sponsor: Electronic Industries Association

Recently, the American Standards Association approved a new project with the scope:

"Standards for the measurement and specification of electrical and other physical characteristics of functional components and equipments used in and with computers and numerical process controls."

This is the project through which the U.S. viewpoint will be developed for presentation in the work of the new international committee on electrical properties of computers and data processing equipment—the International Electrotechnical Commission's committee, IEC/TC 53.

Safety Code for Exhaust Systems, Z9—

Sponsors: American Industrial Hygiene Association; American Society of Heating, Refrigerating, and Air-Conditioning Engineers; Air Moving and Conditioning Association

The draft of a safety code for spray finishing operations is being studied by the sectional committee. The draft covers design, construction, operation, and ventilation for such operations to protect the health of personnel working with spray finishing.

STANDARDS ALIVE

A Guest Column

by LEO B. MOORE

***MR MOORE** is associate professor at the School of Industrial Management of the Massachusetts Institute of Technology, where he teaches a full-term course in industrial standardization.*

EVALUATION IS REQUIRED for the effective management of a standards program. Only through sound evaluation can a manager of standards give concrete evidence of continuing value in the standards efforts, and of his ability to weld these efforts into constructive contributions in the company. Such evidence is the primary purpose of evaluation.

It is of first importance to affirm that evaluation is a required part of a standards program and is, in fact, basic to two different phases of such a program. The first or initial evaluation is made of a proposed standards project to determine its potential contribution; the final or close-out evaluation is made when the project is completed and in operation, to appraise its net impact. Often, intermediate evaluations must be made between the first and last to assess progress.

The ultimate problems of evaluation arise from considerations involving the appropriate technique of evaluation and its suitable application. The important words here are the adjectives and what they connote. The technique employed must have the sanction of the organization, and the method of application must satisfy the individual situation. Failure in either of these, whether within or without the standards department, causes more trouble in evaluating than whether the technique itself is scientifically sound or the use technically correct.

Evaluation is essentially judgment of input versus output; of effort versus gain. Judgment is always susceptible to differences of opinion and raises problems of human reaction, primarily those of a negative nature. Our greatest concern, therefore, should be the human aspects of evaluation rather than the technical.

For example, how does the standards department make a final evaluation of a completed and operating project? The answer is simply that it does *not*. Such evaluation is more properly made by the affected area. What technique does this area use? That technique which on its own it chooses to employ. Why? The standards department is a service organization. The measure of the value of its service must be made by the consumer, and in the final analysis it will be. How much more sensible it is for the standards department to be informed that its activity has a specific worth to the benefitting area in whatever terms that area selects to use, rather than defending an indefensible judgment and incurring the wrath or indifference of the paying customer.

Within the department, the standards manager may use whatever technique he requires to assess the inputs of time, energy, and material to complete a project, but outside the department he places his trust, rightly, in the hands of his consumers. Let the consumers decide whether the project should be pursued, and upon what priority, and let them determine whether the expectation of value has been attained, and to what degree.

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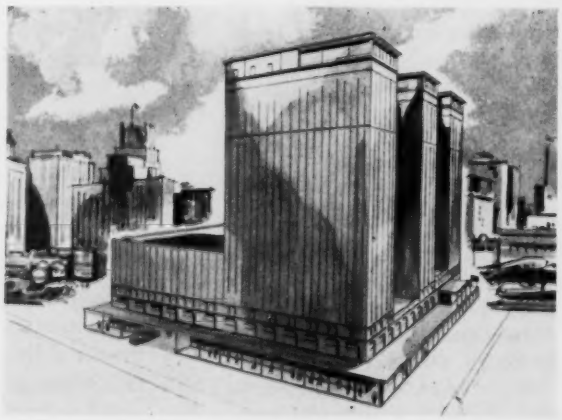

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